

AMERICAN MUSEUM *Novitates*

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY
CENTRAL PARK WEST AT 79TH STREET, NEW YORK, NY 10024
Number 3649, 43 pp., 160 figures June 25, 2009

The Goblin Spider Genera *Opopaea* and *Epectris* (Araneae, Oonopidae) in the New World

NORMAN I. PLATNICK¹ AND NADINE DUPÉRRÉ²

ABSTRACT

Although the type species of the widespread, speciose, and abundant goblin spider genus *Opopaea* Simon was initially described from St. Vincent in the Lesser Antilles, and 15 additional New World taxa have since been assigned to the genus, we hypothesize that *Opopaea* is not native to the New World, and is represented in America only by introduced species that, although now pantropical in distribution, are of Old World origin. *Myrmecoscapbiella* Mello-Leitão is placed as a junior synonym of *Opopaea*, and its type species, *M. borgmeyeri* Mello-Leitão from Brazil, is newly synonymized with *O. concolor* (Blackwall), as are also *O. devia* Gertsch from Texas, *O. guaraniana* Birabén from Argentina, and *O. bandina* Chickering from Florida. *Opopaea timida* Chickering, from Panama, is placed as a junior synonym of the type species, *O. deserticola* Simon, which is newly recorded from Mexico, Costa Rica, Bermuda, the Bahama Islands, Jamaica, Hispaniola, Puerto Rico, the Virgin Islands, Barbados, Trinidad, Colombia, and Brazil; *O. concolor* is newly recorded from Mexico, Costa Rica, the Bahama Islands, Cuba, Jamaica, Ecuador, the Galapagos Islands, Peru, and Hawaii. A third widespread species has most commonly been cited as *O. lena* Suman, originally described from Hawaii and recently chosen as the type species of the monotypic genus *Nale* Saaristo and Marusik. *Nale* is here placed as a junior synonym of *Epectris* Simon, as its type species is placed as a junior synonym of *E. apicalis* Simon, described from the Philippines; *E. apicalis* is newly recorded from Florida, Mexico, Panama, Ecuador, Réunion, Singapore, Borneo, Micronesia, and New Caledonia. *Opopaea cupida* (Keyserling) is transferred to *Marsupopaea* Cooke; *O. recondita* Chickering is transferred to *Brignolia* Dumitresco and Georgesco. In a supplement, *Pelcinus vernalis* (Bryant), described from Florida, is also placed as a junior synonym of *O. concolor*.

¹ Peter J. Solomon Family Curator, Division of Invertebrate Zoology, American Museum of Natural History; Adjunct Professor, Department of Biology, City College, City University of New York; Adjunct Professor, Department of Entomology, Cornell University; Adjunct Senior Research Scientist, Center for Environmental Research and Conservation, Columbia University (platnick@amnh.org).

² Scientific Assistant, Division of Invertebrate Zoology, American Museum of Natural History (nduperre@amnh.org).

INTRODUCTION

Opopaea is one of several goblin spider genera that were first described in a paper on the spiders of the Lesser Antillean island of St. Vincent by Simon (1891). The type (and only) species initially assigned to the genus, *Opopaea deserticola* Simon, has a distinctively enlarged male palpal patella that connects subproximally to the palpal femur (rather than proximally, as is normally the case). Both features were clearly illustrated by Simon (1891: fig. 5).

Given these obvious palpal synapomorphies, one might expect that the subsequent history of the genus would have been straightforward, but that was not the case. For many decades, the limits of the genus were highly confused, especially with regard to the earlier genus *Gamasomorpha* Karsch (1881). Numerous species that clearly belong to *Opopaea* were initially described in *Gamasomorpha*, and numerous species that do not share the palpal synapomorphies of *O. deserticola* have been mistakenly assigned to *Opopaea*. Some of this confusion was resolved by Brignoli (1974, 1975, 1983), who transferred several specific names from *Gamasomorpha* to *Opopaea*, as well as one in the other direction. Nevertheless, numerous taxa remain misplaced and their relationships still need to be clarified.

In part because of this confusion, *Opopaea* has become one of several oonopid genera that have grown to such an unwieldy size, including species from such far-flung parts of the world, as to impede revisionary efforts. The genus encompasses no fewer than 52 currently valid specific names (and thus constitutes more than 10% of the total described diversity of the family); 13 of those names putatively represent New World members (Platnick, 2009). As part of the Planetary Biodiversity Inventory (PBI) project on oonopids, Barbara Baehr of the Queensland Museum is undertaking a revision of this large complex.

The PBI project currently involves over 40 investigators in 10 countries. One of the main reasons that goblin spiders were chosen for an intensive, global revision is that the distribution ranges of oonopid species tend to be extremely small, and the group thus has the potential to provide substantial amounts of

information on areas of endemism, on a worldwide scale. Such highly localized taxa are potentially extremely valuable, both scientifically (for studies of historical biogeography) and to society (for help in establishing conservation priorities among areas of endemism).

This generalization about oonopid distribution patterns is based primarily on what has been learned to date about the ground and litter-dwelling fauna. In recent years, oonopids have also been shown to be a significant component of the canopy fauna as well, in both tropical and subtropical regions (Fannes et al., 2008), but we do not yet know whether the canopy-dwelling species tend to be as narrowly distributed as the ground-dwelling forms. The generalization about tiny species distributions also does not apply to a rather small number of species that are seemingly synanthropic and have attained pantropical or almost cosmopolitan distributions.

Given the possibility that *O. deserticola* could be one of a large number of closely related species, each endemic to different islands in the West Indies, Barbara Baehr requested our help in determining the identity and distributional limits of the species, and we have therefore examined the specimens of *Opopaea* currently available to us in the New World collections on hand. These collections are substantial, totaling over 2,000 specimens.

We were not surprised to find that *O. deserticola* is not a local island endemic; although initially described from St. Vincent, Simon (1891: 560) indicated that the species “habite presque toutes les régions chaudes et désertiques du globe; je l’ai trouvée dans le Sahara algérien, en Égypte, en Arabie, aux Îles Philippines et au Vénézuëla.” More recently, Saaristo (2001) recorded the species from the Seychelle Islands, and Saaristo and Marusik (2008) have provided a redescription of the species, along with new records from St. Helena, Tonga, Samoa, and the Tuamotu Islands.

We were, however, very surprised to discover that the same seems to be true for all the New World members of the group. Despite the numerous specific names currently available, we hypothesize that there are actually no native American members of this complex. The three species treated below each have a

wide distribution, both within America and elsewhere, but apparently have no close relatives in the New World. We therefore suspect that all three species actually originated in the Old World and that all their American populations are introduced rather than native.

We have supplied stereoscope, compound microscope, and scanning electron microscope images for each species. For compound microscopy, specimens were temporarily mounted in clove oil. For scanning electron microscopy of internal structures, abdomens were digested in pancreatin before being coated (Álvarez-Padilla and Hormiga, 2008); external structures were occasionally obscured by unknown, oval artifacts (e.g., fig. 22) that were not dislodged by ultrasonication.

COLLECTIONS EXAMINED

AMNH	American Museum of Natural History, New York
BMNH	Natural History Museum, London, England
CAS	California Academy of Sciences, San Francisco
CNC	Canadian National Collection, Ottawa, Canada
FMNH	Field Museum of Natural History, Chicago
FSCA	Florida State Collection of Arthropods, Gainesville
INBIO	Instituto Nacional de Biodiversidad, Santo Domingo, Costa Rica
JAB	J. A. Beatty collection, Carbondale, Illinois
KBIN	Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussels, Belgium
MACN	Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina
MCZ	Museum of Comparative Zoology, Harvard University
MHNG	Muséum d'Histoire Naturelle, Geneva, Switzerland
MIUP	Museo de Invertebrados, Universidad de Panamá
MNHN	Muséum d'Histoire Naturelle, Paris, France
MNRJ	Museu Nacional, Universidade Federal do Rio de Janeiro, Brazil
MZUT	Museum of Zoology, University of Turku, Finland
TMM	Texas Memorial Museum, Lubbock

USNM National Museum of Natural History, Smithsonian Institution

SYSTEMATICS

Opopaea Simon

Opopaea Simon, 1891: 560 (type species by monotypy *Opopaea deserticola* Simon).

Myrmecoscaphiella Mello-Leitão, 1926: 1 (type species by original designation *Myrmecoscaphiella borgmeyeri* Mello-Leitão). NEW SYNONYMY.

DIAGNOSIS: Males of *Opopaea* are easily recognized by the unusual conformation of the palpal patella, which is oddly enlarged and originates subbasally from the palpal femur (figs. 55, 56, 61, 62, 93, 94, 99, 100). A similarly modified palpal patella occurs in some other Old World taxa, such as those currently assigned to *Camptoscaphiella* Caporiacco (1934), but in those males, the palpal cymbium and bulb are separate, rather than fused as in *Opopaea*. In the New World, males are likely to be confused only with those of *Marsupopaea* Cooke (1972), which can easily be distinguished by the large sternal excavation that provides a “pouch” in which the palps are held (Cooke, 1972: fig. 10). Females are more difficult to characterize, but in the New World they are most likely to be confused with those of *Brignolia* Dumitresco and Georgesco (1983), which are similar in appearance but can be distinguished by the presence of a central elevated projection on the epigastric region (Saaristo, 2001: fig. 142A, B).

DESCRIPTION: A detailed generic description has been provided by Saaristo and Marusik (2008: 18), and improvements on that summary must await a full revision of the Old World fauna.

MISPLACED SPECIES: We discuss here the specific names that are currently assigned to the genus and are based on New World specimens, but do not actually belong to *Opopaea*.

Opopaea cupida (Keyserling, 1881) was originally described in *Oonops*, but Simon (1891) noted the similarities of this species to *O. deserticola*, and the name was later formally transferred to *Opopaea* by Simon (1893a: 299). Brignoli (1975: 228) pointed out that *O. cupida* might be a senior synonym of *Marsupopaea sturmi* Cooke (1972), which is the type species of that genus. A comparison of the two holotypes,

both from Colombia, confirms Brignoli's conjecture (at least at the generic level), and *O. cupida* is here transferred to *Marsupopaea cupida*, NEW COMBINATION.

Three species from the United States, *O. floridana* (Banks, 1896, originally described in *Gamasomorpha*) from Florida, *O. meditata* Gertsch and Davis (1936) from Texas, and *O. sedata* Gertsch and Mulaik (1940) from Texas, are based on females that differ from those of *Opopaea* in having the much more heavily sclerotized epigastric region characteristic of members of the *Gamasomorpha* complex of genera. Because the limits of *Gamasomorpha* itself remain to be determined, we leave these species in *Opopaea* pending their examination by Ricardo Ott as part of his studies on the *Gamasomorpha* complex. The same is true for *O. calona* Chickering (1969) from Florida, the male of which has an unexpanded palpal patella and palpal bulb morphology unlike those of true *Opopaea*.

Opopaea recondita Chickering (1951) from Panama has an epigastric region with a central elevated projection, and the name is therefore transferred to *Brignolia recondita*, NEW COMBINATION. It may well prove to be a senior synonym of the type species of that genus, *Brignolia cubana* Dumitresco and Georgesco (1983), which (like the three species treated below) is seemingly synanthropic and pantropical.

Finally, two more recently described species from southern Brazil, *O. ita* Ott (2003) and *O. viamao* Ott (2003), differ from true *Opopaea* in having the posterior median eyes reduced or absent, and will be placed elsewhere in future contributions by Ricardo Ott.

SYNONYMY: Mello-Leitão (1926) provided no characters to differentiate *Myrmecosca phiella* from *Opopaea*, and there appears to be none.

Opopaea deserticola Simon

Figures 1–72

Opopaea deserticola Simon, 1891: 560, pl. 42, fig. 5 (female syntype from St. Vincent, in BMNH, examined). – Dumitresco and Georgesco, 1983: 103, pl. 21, figs. 1–6. – Saaristo, 2001: 333, figs. 93A–98A, 99–101. – Baert et al., 2008: 56. – Saaristo and Marusik, 2008: 22, figs. 22–29, 137–146, 178, 194, 200, 210, 219, 226.

Opopaea darlingtoni Bryant, 1940: 267, figs. 5, 7 (male holotype from Maisí, Guantánamo, Cuba, in MCZ, examined). First synonymized by Dumitresco and Georgesco, 1983: 103.

Gamasomorpha floridana: Bryant, 1945a: 199, figs. 1, 2 (male, misidentified).

Opopaea timida Chickering, 1951: 233, figs. 20, 21 (male holotype believed to have been taken from a bat collected in the Chilibrillo Caves, Canal Zone, Panama, in MCZ, examined). NEW SYNONYMY.

Opopaea brasima Chickering, 1969: 148, figs. 4–10 (male holotype from Kendall, Dade Co., Florida, in AMNH, examined). First synonymized by Dumitresco and Georgesco, 1983: 103.

DIAGNOSIS: Males can be distinguished from those of *O. concolor* by the ventrally more expanded palpal bulb (figs. 55–58, 61, 62, 64, 66), females by having the small, dark knob marking the origin of the receptaculum situated very close to the epigastric furrow (figs. 59, 60, 67, 68).

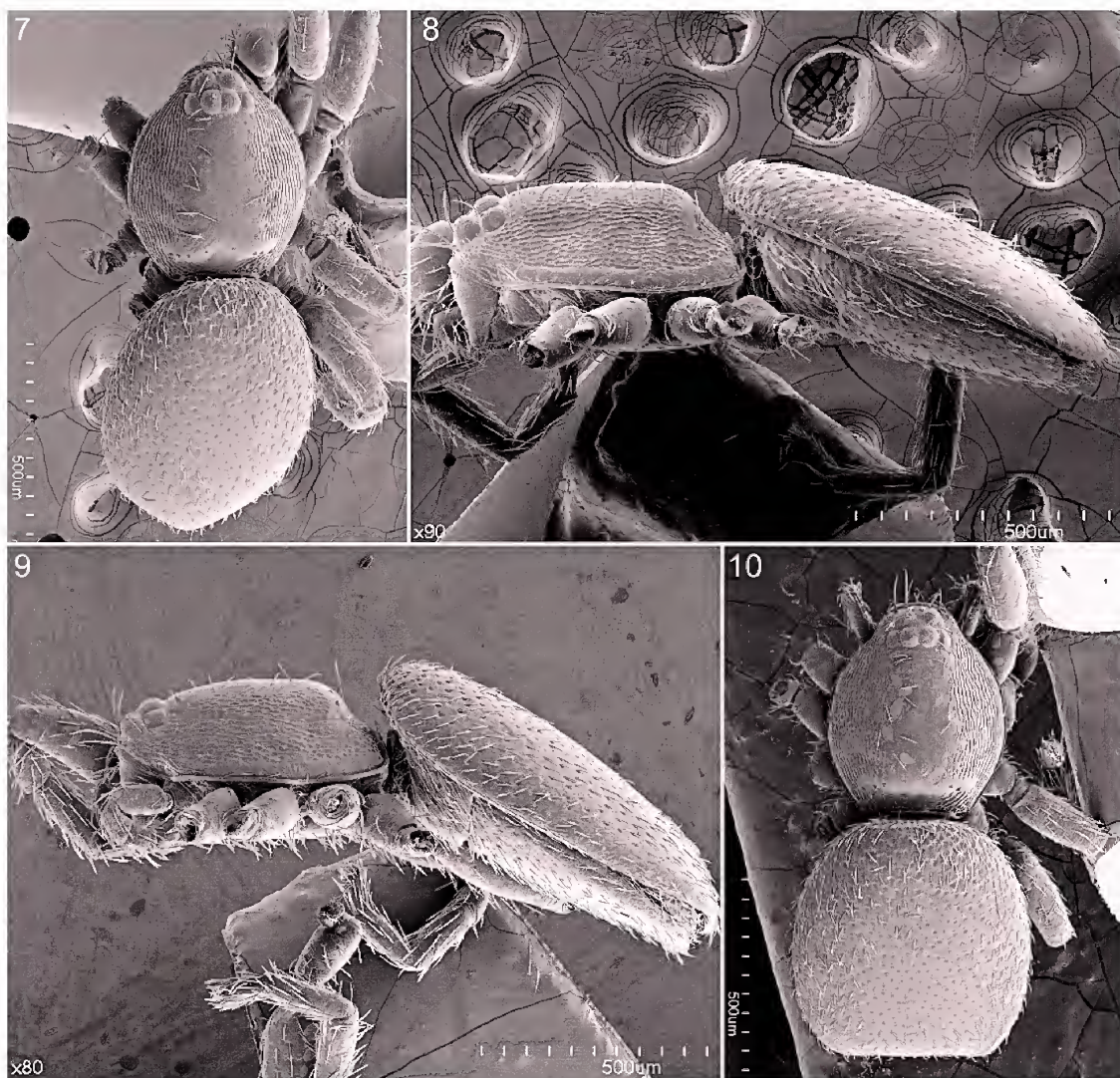
MALE (PBI_OON 1281). Total length 1.25, habitus as in figs. 1–3, 7, 8. CEPHALOTHORAX: *Carapace*: Pale orange, without any pattern, ovoid in dorsal view (fig. 11), pars cephalica slightly elevated in lateral view (fig. 12), anteriorly narrowed to 0.49 times its maximum width or less; posterolateral corners angular, posterolateral edge without pits (fig. 14), posterior margin not bulging below posterior rim (fig. 21); anterolateral corners without extension or projections; posterolateral surface without spikes; lateral margins straight, rebordered, without denticles; surface of elevated portion of pars cephalica smooth (fig. 19), sides striated (fig. 20); deep depressions absent, fovea absent, pars thoracica without radiating rows of pits; nonmarginal pars cephalica setae dark, needlelike, in U-shaped row; nonmarginal pars thoracica setae dark, needlelike; marginal setae light, needlelike; sides of pars cephalica with scattered pores set in slight depressions (fig. 36). *Clypeus*: Margin unmodified, curved downwards in front view, vertical in lateral view, low, ALE separated from edge of carapace by less than their radius, median projection absent; setae dark, needle-like. *Chilum*: Absent. *Eyes*: Six, well developed, ALE largest; ALE oval, PME squared, PLE oval; posterior eye row straight from above, procurved from front (fig. 13); ALE separated by less than their radius, ALE-PLE separated by less than ALE radius, PME touching through-



Figs. 1–6. *Opopaea deserticola* Simon, habitus. 1–3. Male. 4–6. Female. 1, 4. Dorsal view. 2, 5. Ventral view. 3, 6. Lateral view.

out most of their length, PLE-PME separated by less than PME radius. *Sternum*: Longer than wide, pale orange, uniform, fused to carapace, median concavity absent; radial furrows present between coxae I–II, II–III, III–IV (fig. 25), wrinkled, radial furrow opposite coxae III absent; surface smooth, without pits, microsculpture only in furrows,

sickle-shaped structures not touching, anterior margin unmodified, posterior margin not extending posteriorly of coxae IV; anterior corner unmodified, lateral margin with infra-coxal grooves connecting anterior and posterior openings, distance between coxae II and III greater than distance between coxae I and II, or coxae III and IV, precoxal triangles



Figs. 7–10. *Opopaea deserticola* Simon, habitus, SEM. 7, 8. Male. 9, 10. Female. 7, 10. Dorsal view. 8, 9. Lateral view.

absent, lateral margins unmodified, without posterior hump; setae sparse, dark, needlelike, densest laterally, originating from surface; hair tufts absent. **Mouthparts:** Chelicerae, endites, and labium pale orange. Chelicerae straight, anterior face unmodified; promargin without teeth, retromargin without teeth; fang toothlike projections absent, fang directed medially, shape normal, without prominent basal process, tip unmodified (fig. 26); setae dark, needlelike, evenly scattered; paturon inner margin with scattered setae, distal region unmodified, promargin unmodified, inner

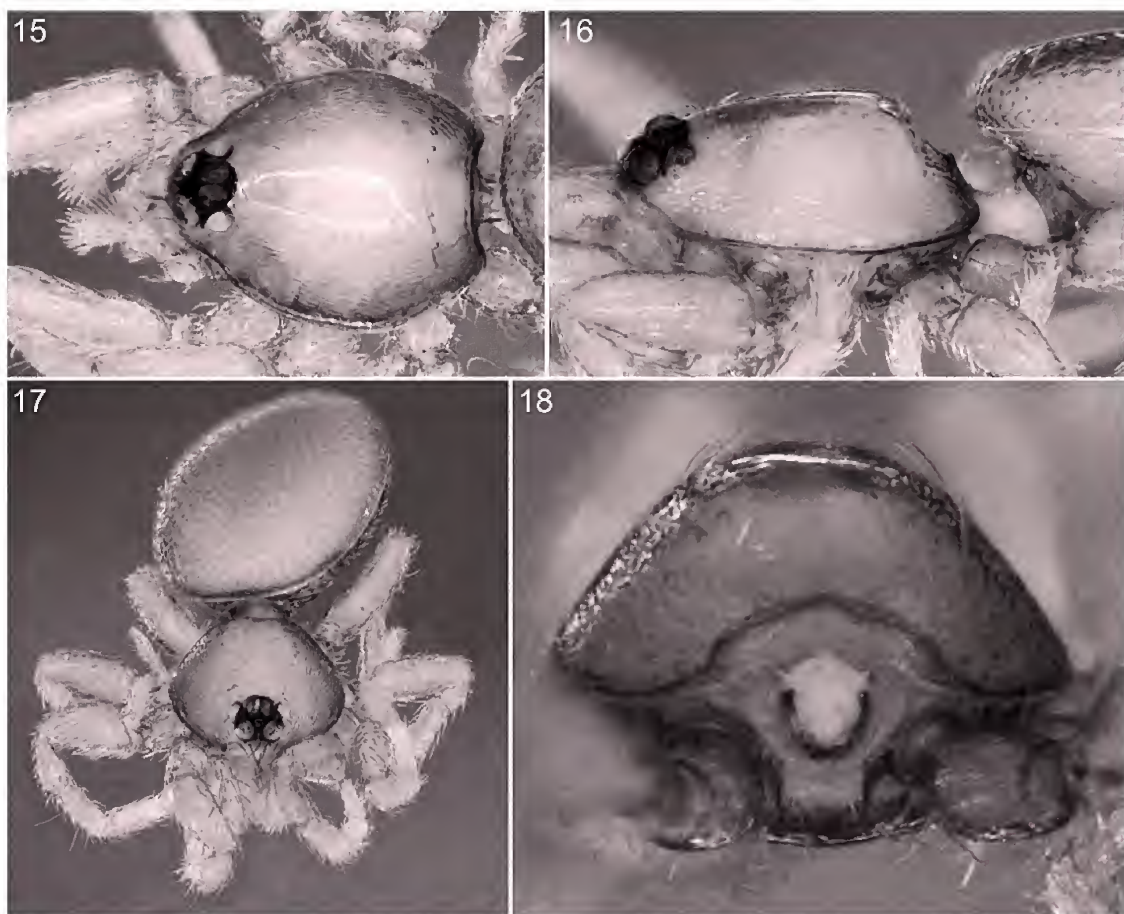
margin unmodified, laminate groove absent. Labium triangular, fused to sternum, with anterior margin indented at middle, same as sternum in sclerotization; six or more setae present on anterior margin, subdistally with unmodified setae. Endites distally not excavated, serrula present in single row, antero-medial tip with one strong, toothlike projection (figs. 27, 28), posteromedian part unmodified, same as sternum in sclerotization. **ABDOMEN:** Cylindrical, without long posterior extension, rounded posteriorly, interscutal membrane without rows of small sclerotized



Figs. 11–14. *Opopaea deserticola* Simon, cephalothorax, male. 11. Dorsal view. 12. Lateral view. 13. Anterior view. 14. Posterior view.

platelets; soft portions white, without color pattern. Book lung covers small, ovoid, without setae, anterolateral edge unmodified. Posterior spiracles connected by groove. Pedicel tube short, ribbed, with small, dorso-lateral, triangular extensions (fig. 33), scuto-pedicel region with paired curved scutal ridges (fig. 29), scutum not extending far dorsal of pedicel, plumose hairs present dorsal and lateral of pedicel, matted setae on anterior ventral abdomen in pedicel area absent; cuticular outgrowths near pedicel absent. Dorsal scutum strongly sclerotized, pale orange, without color pattern, covering full length of abdomen, no soft tissue visible from above, not fused to epigastric scutum, middle surface punctate, sides punctate, anterior half without projecting denticles. Epigastric scutum surrounding pedicel, not protruding,

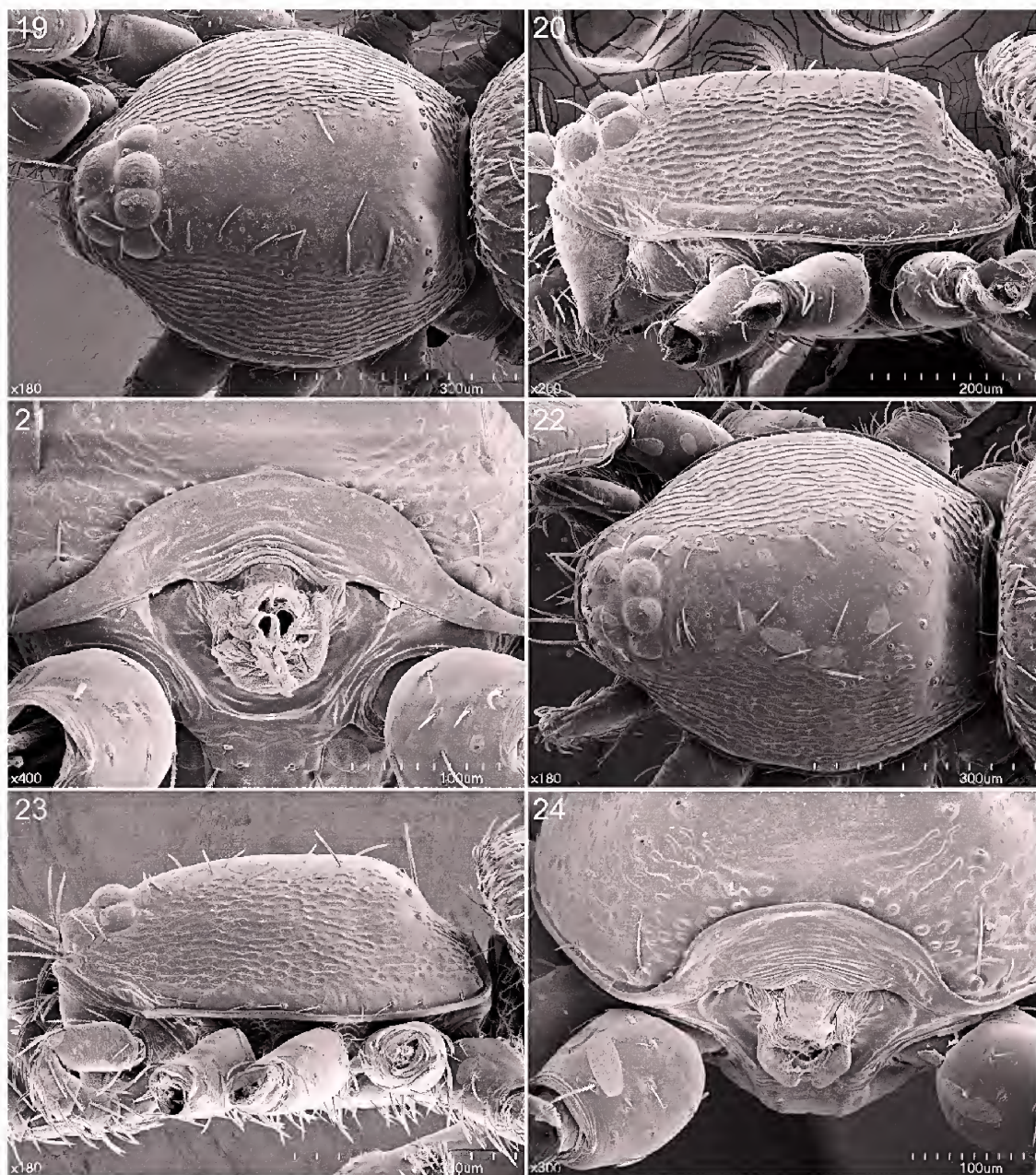
small lateral sclerites absent. Postepigastric scutum strongly sclerotized, pale orange, long, semicircular, covering nearly full length of postepigastric area, fused to epigastric scutum, anterior margin unmodified, with short posteriorly directed lateral apodemes. Spinneret scutum present, incomplete ring. Supra-anal scutum absent. Dorsum setae light, needlelike. Epigastric area setae uniform, dark, needlelike. Postepigastric area setae dark, needlelike. Spinneret scutum with fringe of long setae. Interscutal membrane with setae. Dense patch of setae anterior to spinnerets absent. Colulus present. LEGS: Yellow, without color pattern. Femur IV not thickened, patella plus tibia I shorter than carapace, tibia I unmodified, tibia I Emerit's glands absent, tibia IV specialized hairs on ventral apex absent, ventral scopula absent, metatarsi I and II meso-apical comb



Figs. 15–18. *Opopaea deserticola* Simon, cephalothorax, female. 15. Dorsal view. 16. Lateral view. 17. Anterior view. 18. Posterior view.

absent, metatarsi III and IV weak ventral scopula absent, tibiae and metatarsi with scattered pores set in small depressions without raised margins (fig. 39). Leg spines absent. Tarsal proclaws inner face striate, retroclaws inner face striate. Tarsi I, II superior claws with one tooth on lateral surface of proclaw, five teeth on median surface, one tooth on lateral surface of retroclaw, five teeth on median surface (fig. 41). Tarsi III, IV superior claws with one tooth on lateral surface of proclaw, four teeth on median surface, one tooth on lateral surface of retroclaw, four teeth on median surface (figs. 42–44). Trichobothria examined with SEM, tibia: each with three (fig. 37); metatarsus: each with one (fig. 40); base rounded, aperture internal texture grate-like, hood smooth (fig. 38). Tarsal organ

apparently with 3–5 sensillae (fig. 51). GENITALIA: Epigastric region with sperm pore visible, small, oval, situated at level of anterior spiracles (fig. 30), rebordered (fig. 35). Epigastric furrow without Ω -shaped insertions, without setae. Palp normal size, not strongly sclerotized, right and left palps symmetrical. Cymbium pale orange, bulb pale orange, proximal segments pale orange, embolus light. Embolus prolateral excavation absent. Trochanter normal size, unmodified. Femur normal size, two or more times as long as trochanter, without posteriorly rounded lateral dilation, attaching to patella subbasally (figs. 55, 56, 61, 62). Patella longer than femur, much larger than femur, without prolateral row of ridges, setae unmodified. Tibial trichobothria examined using SEM, three (fig. 63). Tarsal

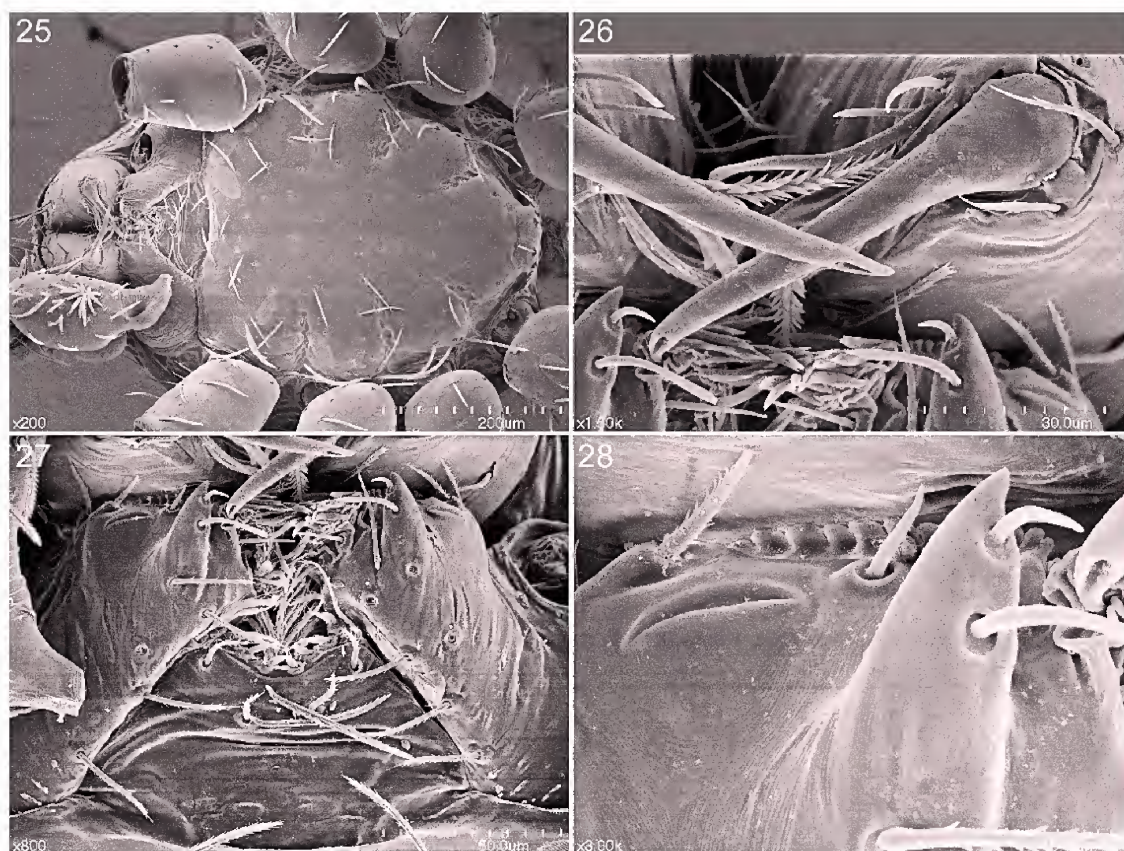


Figs. 19–24. *Opopaea deserticola* Simon, cephalothorax, SEM. 19–21. Male. 22–24. Female. 19, 22. Dorsal view. 20, 23. Lateral view. 21, 24. Posterior view.

organ with at least two sensillae (fig. 52). Cymbium narrow in dorsal view, completely fused with bulb, no seam visible, not extending beyond distal tip of bulb, plumose setae absent, without stout setae, without distal patch of setae. Bulb 1 to 1.5 times as long as cymbium,

slender, elongated, ventrally expanded (figs. 57, 58, 66), with dorsal fenestra (figs. 64, 65).

FEMALE (PBI_OON 1299). Total length 1.50, habitus as in figs. 4–6, 9, 10. As in male except as noted. **CEPHALOTHORAX** (figs. 15–18, 22–24): Endites anteromedian tip

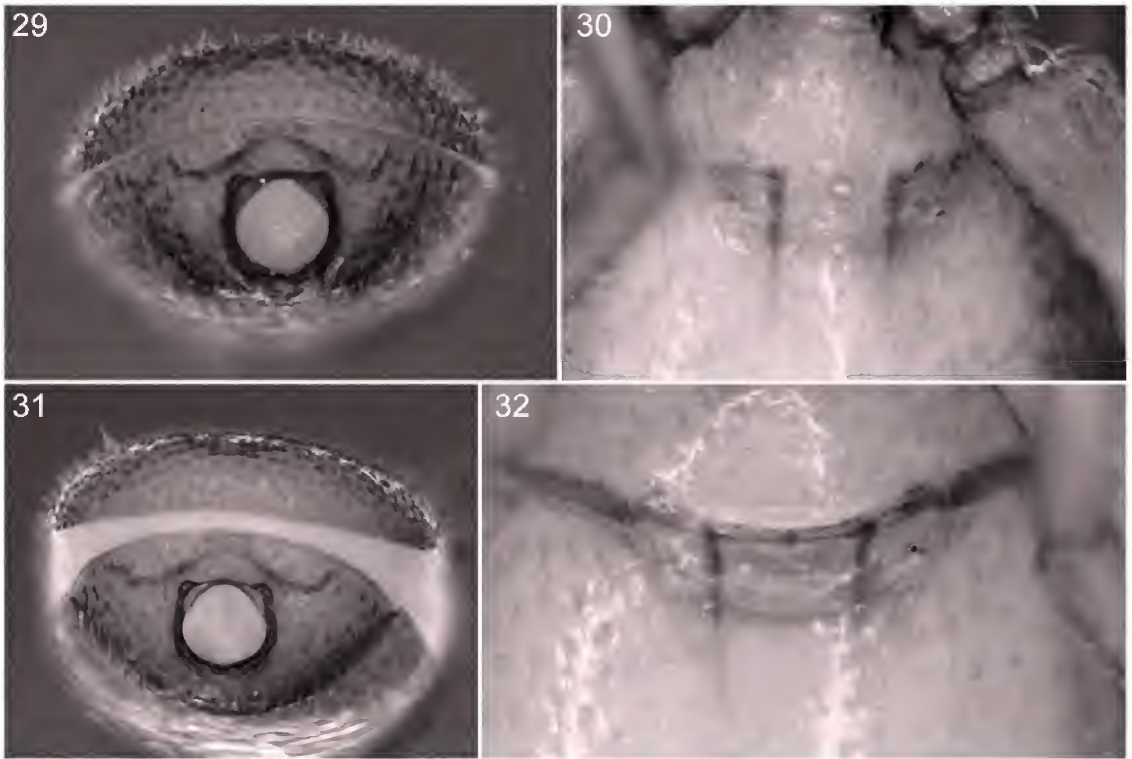


Figs. 25–28. *Opopaea deserticola* Simon, cephalothorax, male, SEM. 25. Sternum and mouthparts, ventral view. 26. Chelicerae, ventral view. 27. Endites and labium, ventral view. 28. Spur on endite, ventral view.

unmodified. *Palp*: claw absent; spines absent; tarsus unswollen (fig. 72), patella without prolateral row of ridges, tibia with two trichobothria (fig. 71), tarsal organ elongate (fig. 54). **ABDOMEN** (figs. 31, 32, 34): Dorsal scutum covering more than 3/4 of abdomen, more than 1/2 to most of abdomen width. Postepigastric scutum covering about 3/4 of postepigastric area, not fused to epigastric scutum. Anterior lateral spinnerets with large major ampullate gland spigot, posterior medians with two spigots, posterior laterals with three spigots (fig. 70). **LEGS**: Tarsi I, II superior claws median surfaces with 10–12 small, distal teeth, lateral surfaces with 5 large, basal teeth (figs. 45–48); tarsus III superior claws median surfaces with four small, distal teeth, lateral surfaces with five large, basal teeth; tarsus IV superior claws

median surfaces with three small, distal teeth, lateral surfaces with five large, basal teeth (figs. 49, 50). Tarsal organ opening piriform (fig. 53). **GENITALIA**: Ventral view: epigastric region with sclerotization marking origin of receptaculum situated close to epigastric furrow (figs. 59, 67, 68). Dorsal view: receptaculum short, T-shaped, situated near epigastric furrow (figs. 60, 69).

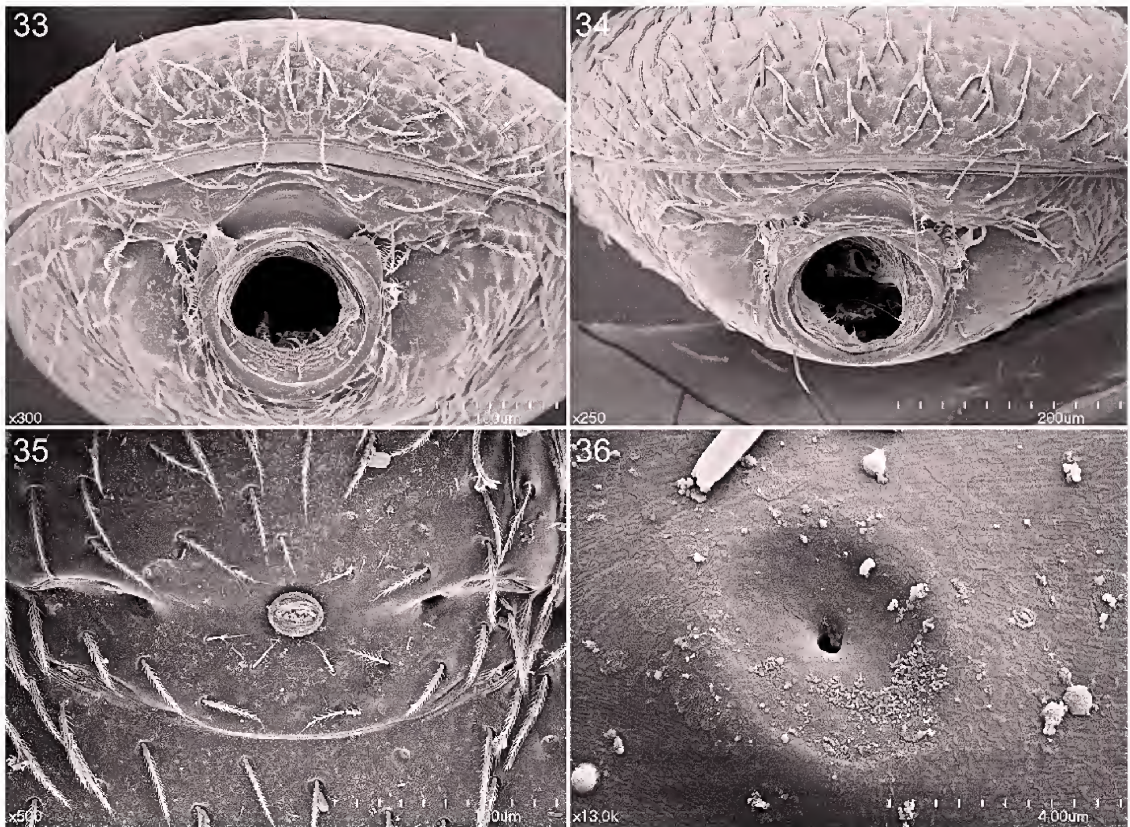
MATERIAL EXAMINED: UNITED STATES: **Florida:** *Alachua Co.*: no specific locality, Jan. 23, 1937, in bathroom (H. Wallace, MCZ 71991, PBI_OON 26986), 1♂. *Charlotte Co.*: Punta Gorda, Jan. 1–16, 1946 (S. Rounds, AMNH PBI_OON 1203), 1♀. *Collier Co.*: Marco Island, Jan. 1, 1930 (W. Barrows, AMNH PBI_OON 1984), 1♂. *Dade Co.*: Deering Estate Park, SW 167th St. and SW 72nd Ave., S Miami, Nov. 15, 1985, hammock



Figs. 29–32. *Opopaea deserticola* Simon, abdomen. 29, 30. Male. 31, 32. Female. 29, 31. Anterior view. 30, 32. Epigastric area, ventral view.

forest litter (S. Peck, AMNH PBI_OON 1295), 20♀, Nov. 15–23, 1985, hammock pitfall (S. Peck, AMNH PBI_OON 1284), 2♀, Feb. 21–June 1, 1986, old hammock forest, malaise-flight intercept trap (S., J. Peck, AMNH PBI_OON 1282), 1♂, June 1–Aug. 25, 1986, same (S., J. Peck, AMNH PBI_OON 1268, 1285), 3♀, Aug. 25, 1986, Berlese, forest litter (S., J. Peck, AMNH PBI_OON 1270), 1♀, Dec. 9, 1986, forest litter (S. Peck, Klimaszewski, AMNH PBI_OON 1293), 2♀; 2–5 mi S Florida City, Apr. 1, 1957 (R. Forster, W. Gertsch, AMNH PBI_OON 1205), 1♀; Homestead, Mar. 13, 1968, avocado grove (A. Chickering, MCZ 71990, PBI_OON 26985), 1♀, Mar. 21, 1968, avocado grove (A. Chickering, MCZ 72095, PBI_OON 26983), 1♂, 1♀; Kendall, Mar. 4, 1953 (A. Nadler, AMNH PBI_OON 37497), 1♂ (holotype); Matheson Hammock Park, 9800 Old Cutler Road, S Miami, Nov. 14, 1985, hammock litter (S. Peck, AMNH PBI_OON 1298), 13♀; 7900 SW 176th St., S

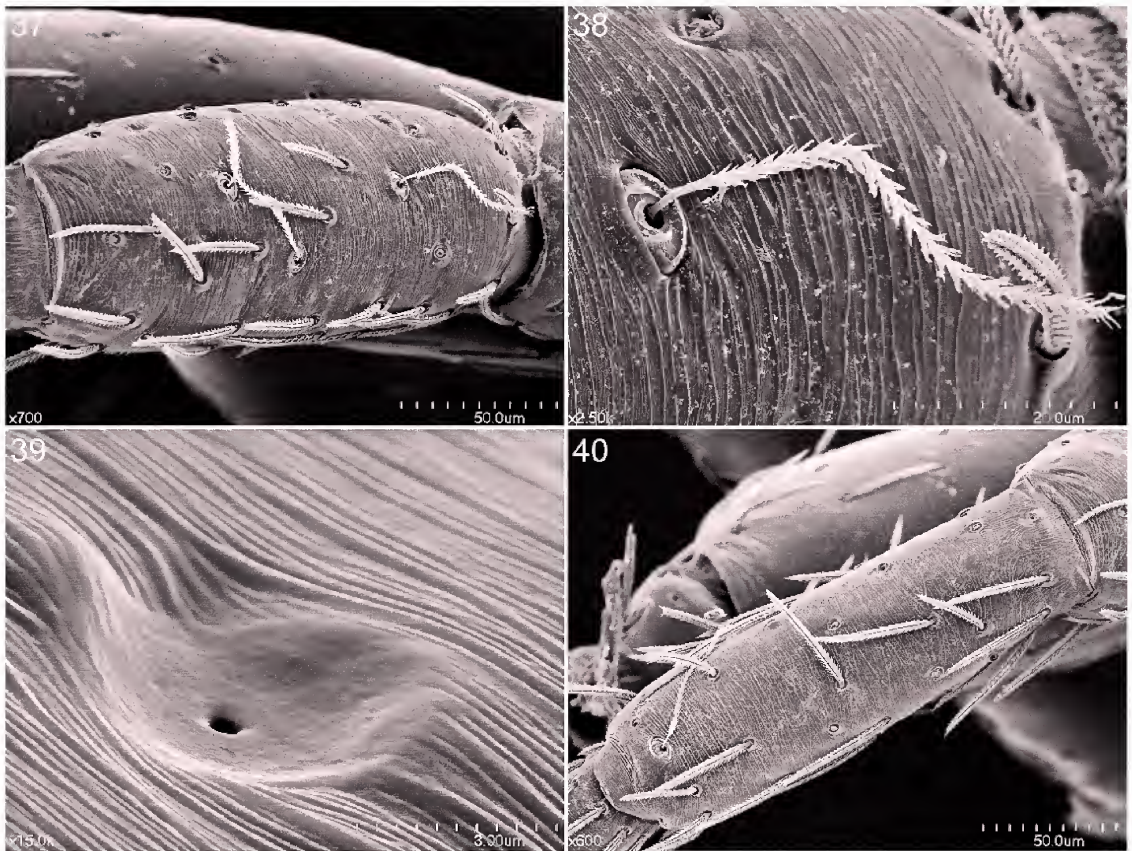
Miami, Feb. 21–June 1, 1986, Old Cutler Hammock, malaise-flight intercept trap (S., J. Peck, AMNH PBI_OON 1287), 1♂. *Highlands Co.*: Sebring, Lake Jackson, Feb. 20, 1982, uprooting dead bunch grass (G. Edwards, FSCA PBI_OON 21186), 1♂, 5♀. *Indian River Co.*: Vero Beach, July 10, 1990, on *Avicennia germinans* (K. Hibbard, K. Dady, FSCA PBI_OON 21185), 1♂. *Lee Co.*: Fort Myers, 26°38'N, 81°50'W, Mar. 18, 1954 (W. Ivie, AMNH PBI_OON 1326), 1♂, 4♀; Fort Myers Beach, 26°26'N, 81°56'W, Mar. 17, 1954 (W. Ivie, AMNH PBI_OON 1265), 6♂, 14♀. *Monroe Co.*: Big Pine Key, Watsons Hammock, Nov. 17, 1985–Feb. 25, 1986, hammock forest, malaise-flight intercept trap (S., J. Peck, AMNH PBI_OON 1291), 1♀, June 3–Aug. 27, 1986, same (S., J. Peck, AMNH PBI_OON 1277), 1♂; Big Torch Key, Feb. 25–June 5, 1986, hammock forest, malaise-flight intercept trap (S., J. Peck, AMNH PBI_OON 1259), 1♀, June 5–Aug. 28, 1986, same (S., J. Peck, AMNH



Figs. 33–36. *Opopaea deserticola* Simon. 33, 35, 36. Male. 34. Female. 33, 34. Abdomen, anterior view, showing triangular projections on pedicel and plumose hairs near them. 35. Epigastric region, showing sperm pore. 36. Pore from side of pars cephalica.

PBI_OON 1262), 1 ♂; Fleming Key, Mar. 30, 1980, Australian pine litter (G. Edwards, FSCA PBI_OON 10494), 2 ♂, 1 ♀; Key Largo Key, 25°10'N, 80°20'W, Dec. 17, 1962 (W. Ivie, AMNH PBI_OON 1274), 2 ♀; Key West, Dec. 29–31, 1950 (A. Nadler, AMNH PBI_OON 1201, 1207), 2 ♀; Lignum Vitae Key, July 1981, malaise trap and trough (S. Peck, CNC PBI_OON 10493), 2 ♂; 2 mi SE Marathon, 24°37'N, 81°06'W, Dec. 15, 1962 (W. Ivie, AMNH PBI_OON 1200, 1209, 1210, 1281, 1296, 1299), 15 ♂, 24 ♀; Pennekamp State Park, Key Largo, June 2–Aug. 26, 1986, hammock forest, malaise-flight intercept trap (S., J. Peck, AMNH PBI_OON 1272), 1 ♀; Stock Island, botanical garden, Nov. 19, 1985, hammock, leaf litter (S., J. Peck, AMNH PBI_OON 1261), 1 ♀, Dec. 17, 1986, leaf litter (S. Peck, Klimaszewski, AMNH PBI_OON 1294), 3 ♀; Sugarloaf Key, Aug. 29,

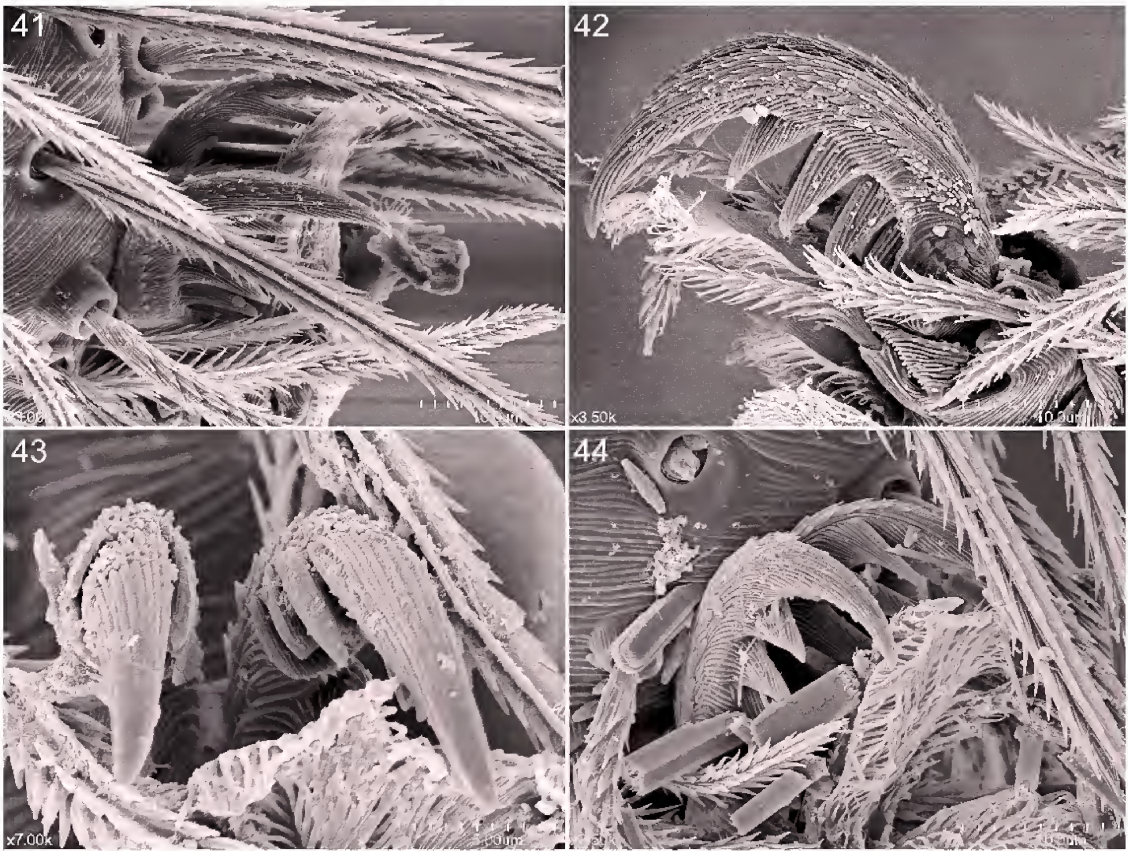
1986, hammock forest leaf litter Berlese (S., J. Peck, AMNH PBI_OON 1280), 1 ♂; Sugarloaf Key, Kitchings, Feb. 26–June 6, 1986, hammock forest, malaise-flight intercept trap (S., J. Peck, AMNH PBI_OON 1258, 1288), 1 ♂, 1 ♀; Windley Key, Aug. 30, 1986, hammock forest, deep soil washing (S., J. Peck, AMNH PBI_OON 1328), 1 ♀. *Pinellas Co.*: Dunedin, no date (AMNH PBI_OON 1084), 1 ♂, 1927 (W. Blatchley, MCZ 71992, PBI_OON 26984), 2 ♀. *Polk Co.*: Haines City, Feb. 28, 1968 (A. Chickering, MCZ 66784, PBI_OON 26982), 1 ♂; Lake Alfred, June 17, 1968, pitfall under citrus (H. Greene, FSCA PBI_OON 21181), 1 ♂. *Suwannee Co.*: McAlpin, Jan. 27, 1976, *Dasylium longitissimum* (C. Webb, FSCA, PBI_OON 21182), 1 ♂. MEXICO: no specific locality (intercepted at New Orleans, Louisiana), Apr. 1, 1936 (K. Miller, USNM 2046648, PBI_OON



Figs. 37–40. *Opopaea deserticola* Simon, male. **37.** Tibia II, dorsal view, showing three trichobothria and pore-bearing depressions. **38.** Trichobothrium from tibia II. **39.** Pore-bearing depression from tibia II. **40.** Metatarsus II, dorsal view, showing single distal trichobothrium.

27928), 1♀, Oct. 2, 1936 (USNM 2046648, PBI_OON 27929), 1♂, 1♀. **Baja California Sur:** 12 mi NE Cabo San Lucas, Feb. 7, 1966, palm oasis (V. Roth, AMNH PBI_OON 1413), 1♂; San José del Cabo, Mar. 4, 1945 (M. Correa, AMNH PBI_OON 1396), 1♀. **Colima:** Cuyutlán, Jan. 9, 1943 (F. Bonet, AMNH PBI_OON 1404), 1♀. **Nayarit:** San Blas, Aug. 10, 1960, grass near beach (AMNH PBI_OON 1392), 1♂, 21°32'N, 105°18'W, May 14, 1963 (W. Gertsch, W. Ivie, AMNH PBI_OON 1406), 3♂, 1♀. **Quintana Roo:** Cozumel, July 14, 1951 (L. Stannard, AMNH PBI_OON 37531), 2♂. **Tamaulipas:** Tampico (intercepted at Laredo, Texas), Jan. 25, 1937 (USNM 2046648, PBI_OON 27927), 1♀. **Veracruz:** Rinconada, June 29, 1941 (H. Dybas, AMNH PBI_OON 1410), 1♀. **Yucatán:** Isla Cozumel, Jan. 23–27, 1984 (V.,

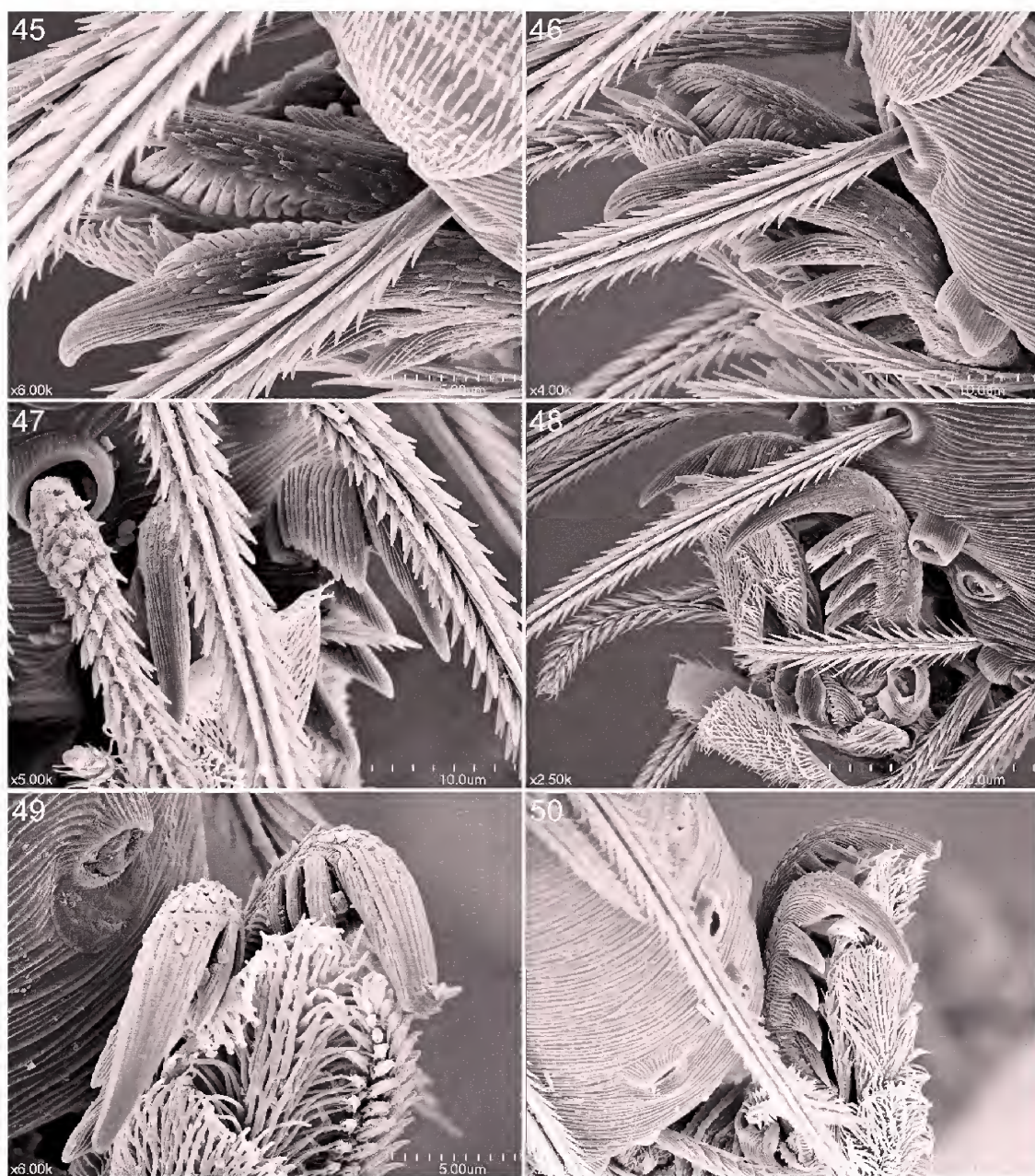
B. Roth, CAS 9023426, PBI_OON 3751), 1♀, COSTA RICA: **Puntarenas:** Bahía Wafer, Isla del Coco, 5°32'56"N, 87°03'37"W, Mar. 31, 2002, elev. 4–10 m (T. Amarilla, INBIO 69554, PBI_OON 37512), 1♀. **PANAMA:** **Canal Zone:** Balboa, May 14, 1964 (A. Chickering, MCZ 72472, PBI_OON 28029), 1♂, May 27, 1964, (A. Chickering, MCZ 72466, 72474, PBI_OON 28027, 28028), 3♂, 19♀, May 28, 1964 (A. Chickering, MCZ 72454, PBI_OON 28030), 1♂, 2♀, May 28–29, 1964 (A. Chickering, MCZ 72461, PBI_OON 28025), 15♂, 30; Barro Colorado Island, May 15, 1964 (A. Chickering, MCZ 68295, PBI_OON 26866), 1♀; Chillibrillo Cave, Chilebre, 1936, from “bat #964, *Dirias albiventer minor*” (L. Dunn, MCZ), 1♂ (holotype); Corozal, May 25, 1964 (A. Chickering, MCZ 72381, PBI_OON 26673),



Figs. 41–44. *Opopaea deserticola* Simon, male, tarsal claws. **41.** Leg I, oblique prolateral view. **42.** Leg III, prolateral view. **43.** Leg III, apical view. **44.** Leg III, retrolateral view.

1♂, May 25–26, 1964 (A. Chickering, MCZ 72471, PBI_OON 28022), 4♂, 18♀; Experimental Gardens, July 9–10, 1954 (A. Chickering, MCZ 72455, PBI_OON 28034), 1♀, July 11, 1954 (A. Chickering, MCZ 68227, PBI_OON 28021), 2♀, July 13, 1954 (A. Chickering, MCZ 72473, PBI_OON 28026), 1♀, July 14, 1954 (A. Chickering, MCZ 72564, PBI_OON 28033), 1♀, Aug. 18, 1954 (A. Chickering, MCZ 72496, PBI_OON 28032), 1♀; Gamboa, Jan. 7, 1958 (A. Chickering, MCZ 72558, PBI_OON 26868), 1♀; Pedro Miguel, July 5, 1950 (A. Chickering, MCZ 72460, PBI_OON 28024), 1♀, Mar. 7, 1958 (A. Chickering, MCZ 72463, PBI_OON 28023), 1♀; Summit Gardens, May 12, 1964 (A. Chickering, MCZ 72560, PBI_OON 26867), 1♂, May 12–13, 1964 (A. Chickering, MCZ 72456, PBI_OON 28031), 4♂, 5♀. **Panamá:** Playa Coronado, Aug. 8, 1983, litter

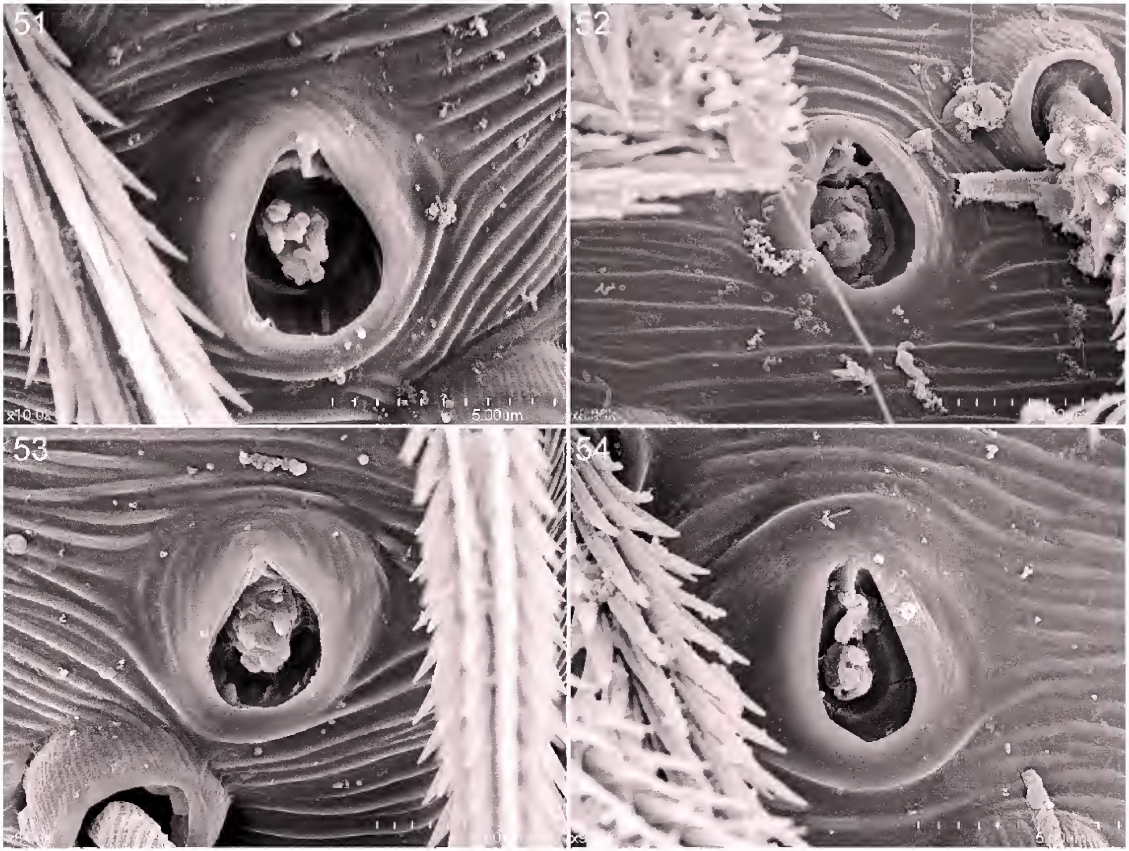
(J., F. Murphy, AMNH PBI_OON 36543), 3♂, 1♀, same date, litter of dry slope with *Acacia* and palms (P. Lehtinen, MZUT PBI_OON 15913), 1♂. **WEST INDIES:** **Bahama Islands:** Nassau Golf Club, Mar. 10, 1967 (A. Nadler, AMNH PBI_OON 97), 1♀; Nicolls Town, Andros, Mar. 14, 1967 (A. Nadler, AMNH PBI_OON 10501), 1♀; North Bimini, Dec. 4, 1952 (A. Nadler, AMNH PBI_OON 1247), 1♂, 1♀, Mar. 26–29, 1953 (A. Nadler, MCZ 72505, PBI_OON 26930), 1♂; South Bimini, May 1951 (W. Gertsch, M. Cazier, AMNH PBI_OON 1254), 6♂, 9♀, June 1951 (M. Cazier, C., P. Vaurie, AMNH PBI_OON 1246, 1248, 1251, 1252, 1255), 8♂, 5♀, Dec. 12–18, 1952 (A. Nadler, AMNH PBI_OON 1250), 2♀. **Bermuda:** no specific locality (AMNH PBI_OON 1238), 1♀. **GREATER ANTILLES:** **Cuba:** *Guantánamo:* Maisí, July 15–16, 1936 (P. Darlington,



Figs. 45–50. *Opopaea deserticola* Simon, female, tarsal claws. 45. Leg I, dorsal view. 46. Same, retrolateral view. 47. Leg II, apical view. 48. Same, retrolateral view. 49. Leg IV, apical view. 50. Leg IV, retrolateral view.

MCZ), 1 ♂ (holotype, missing both palpi but identifiable from Bryant's palpal drawing). **Hispaniola:** *Dominican Republic:* Ciudad Trujillo, Mar. 3, 1955 (A. Nadler, AMNH PBI_OON 1379), 1 ♀. *Haiti:* Damiens, Port-au-Prince, Nov. 9–10, 1959 (A. Nadler,

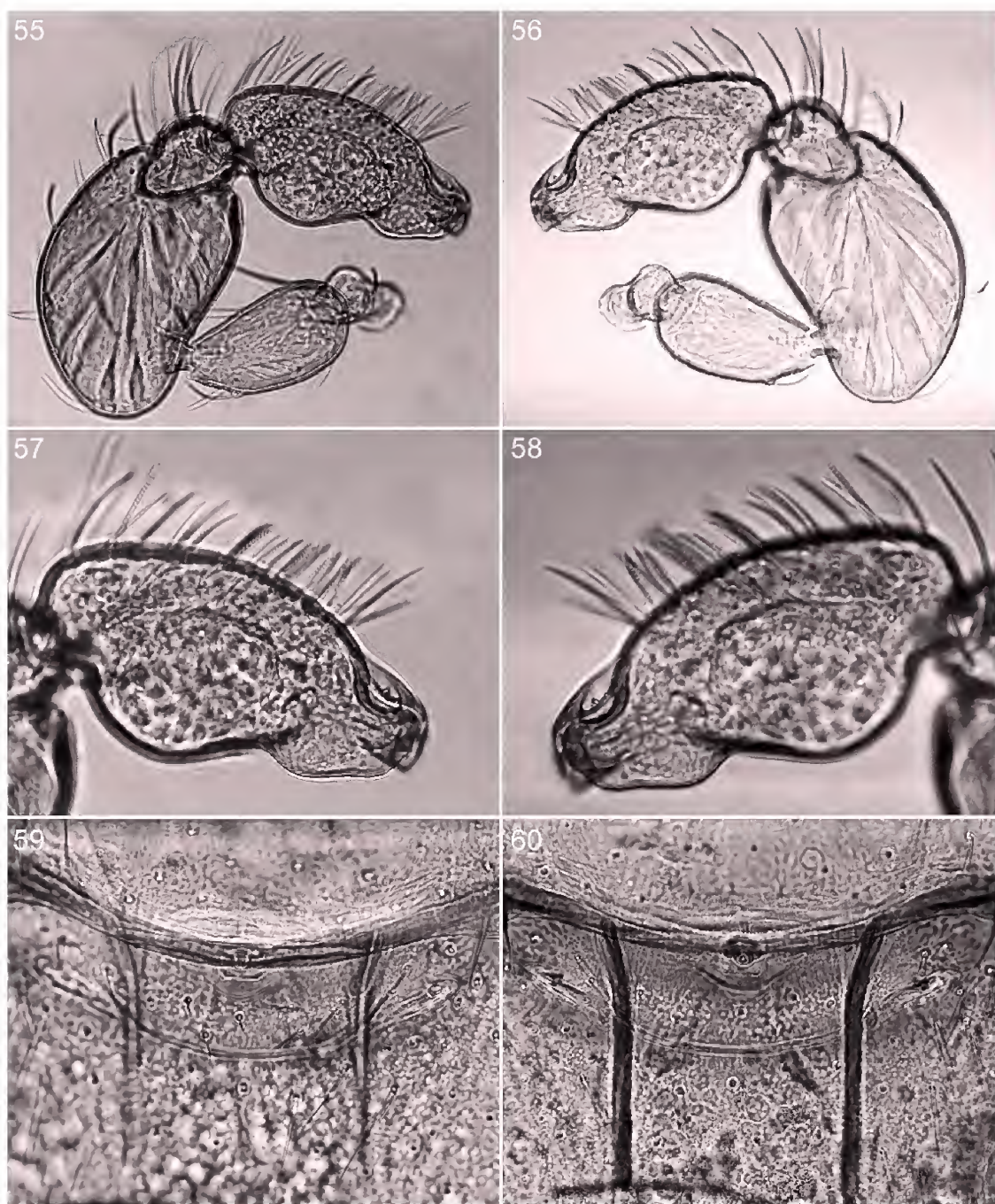
AMNH PBI_OON 1239, 1240), 3 ♀. **Jamaica:** *Clarendon:* Salt River, Nov. 24, 1963 (A. Chickering, MCZ 72373, PBI_OON 26719), 2 ♀. *Kingston:* Buccaneer Beach, Dec. 8, 1963 (A. Chickering, MCZ 72374, PBI_OON 26721), 3 ♂, 10 ♀; Gunboat Beach, Nov. 19, 1963 (A.



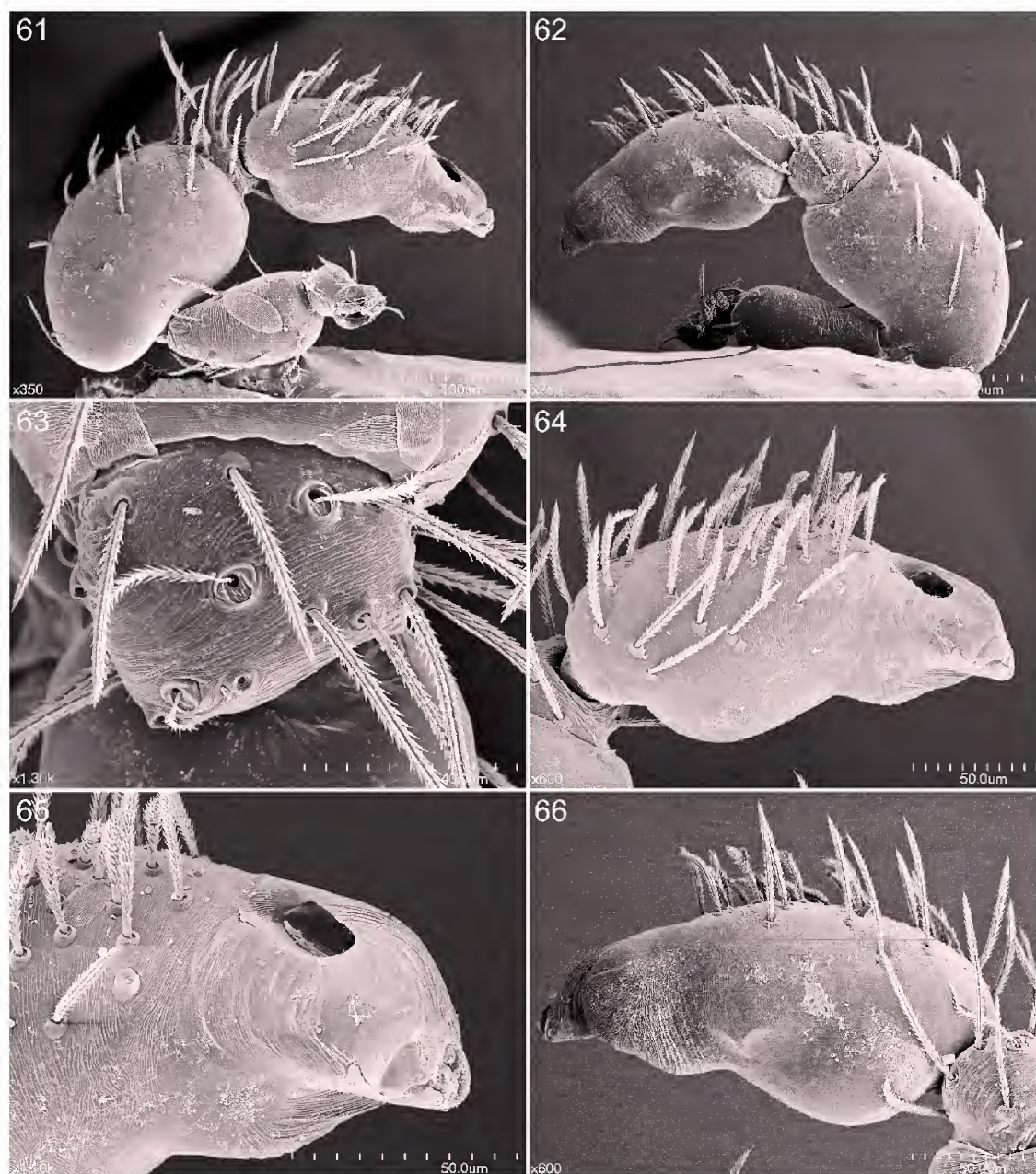
Figs. 51–54. *Opopaea deserticola* Simon, tarsal organ, dorsal view. 51, 52. Male. 53, 54. Female. **51, 53.** Leg I. **52, 54.** Palp.

Chickering, MCZ 72372, PBI_OON 26723), 2♂; Palisadoes, Nov. 1, 1957 (A. Chickering, MCZ 72375, PBI_OON 26724), 3♂, 8♀. *St. Andrew*: Claremont, June 20, 1954 (A. Chickering, MCZ 72371, PBI_OON 26706), 1♀; Fairway Ave., Nov. 8, 1963 (A. Chickering, MCZ 66794, PBI_OON 21232), 1♀, Nov. 18, 1963 (A. Chickering, MCZ 66793, PBI_OON 21284), 1♂, 5♀, Nov. 25, 1963 (A. Chickering, MCZ 68290, PBI_OON 21288), 1♂, 4♀; Ferry, 0.9 mi W Red Hills Road, Sept. 27, 1957 (A. Chickering, MCZ 68293, 72358, PBI_OON 21231, 21236), 1♂, 3♀; Hermitage Road, Nov. 28, 1963 (A. Chickering, MCZ 72356, PBI_OON 37511), 1♀; Hope Gardens, Kingston, Mar. 14, 1955 (A. Nadler, AMNH PBI_OON 1244), 1♂, Oct. 3, 1957, near hotel (A. Chickering, MCZ 68291, PBI_OON 21238), 1♂, Nov. 27, 1963 (A. Chickering, MCZ 66795, PBI_OON 21287), 3♀, Dec. 1, 1963 (A.

Chickering, MCZ 72347, PBI_OON 26672), 1♀, Dec. 6, 1963 (A. Chickering, MCZ 72350, PBI_OON 21234), 1♀, Dec. 19, 1963 (A. Chickering, MCZ 66792, PBI_OON 21235), 1♂; 14.5 mi E Kingston, Nov. 19, 1963 (A. Chickering, MCZ 72280, PBI_OON 21228), 3♂, 2♀; Liguanea, Oct. 19, 1957 (A. Chickering, MCZ 72357, PBI_OON 21282), 2♀, Dec. 21, 1963 (A. Chickering, MCZ 72352, PBI_OON 21283), 1♂; Mona, 1953, grass and bushes (G. Underwood, MCZ 72281, PBI_OON 26677, 37528), 2♀, Oct. 7, 1957 (A. Chickering, MCZ 72351, PBI_OON 26681), 1♀; Mona Heights, Nov. 29, 1963 (A. Chickering, MCZ 72529, PBI_OON 26942), 1♀, Dec. 15, 1963 (A. Chickering, MCZ 72518, PBI_OON 28008), 1♀; Old Hope Road, Liguanea, Oct. 8, 1957 (A. Chickering, MCZ 72354, PBI_OON 21230), 2♂, 2♀; Richards Reservoir, Mona, Nov. 9, 1957 (A. Chickering,



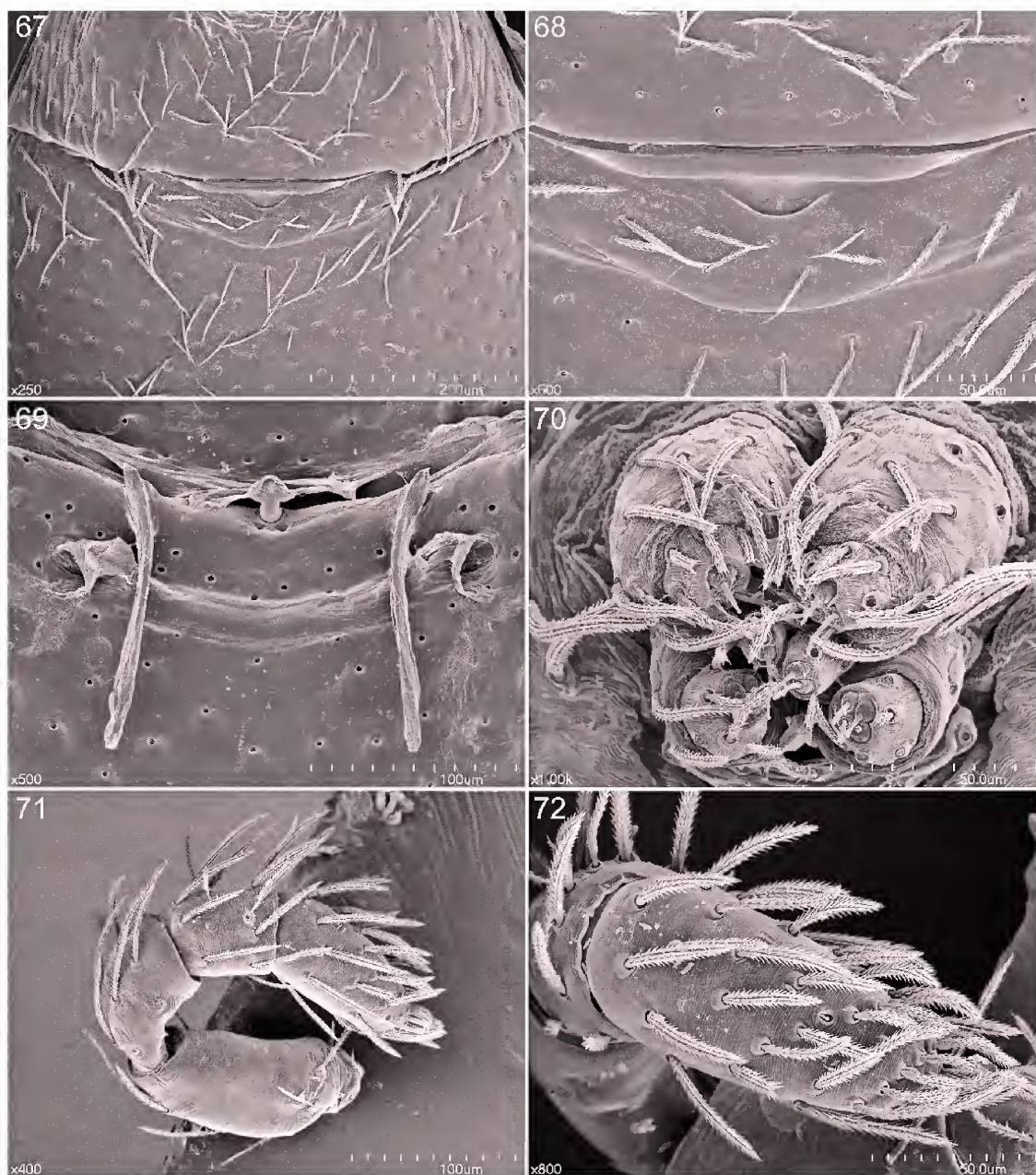
Figs. 55–60. *Opopaea deserticola* Simon, compound microscope. 55–58. Male palp. 59, 60. Female epigastric region. 55. Prolateral view. 56. Retrolateral view. 57. Bulb, prolateral view. 58. Bulb, retrolateral view. 59. Ventral view. 60. Dorsal view.



Figs. 61–66. *Opopaea deserticola* Simon, left male palp, SEM. **61.** Prolateral view. **62.** Retrolateral view. **63.** Tibia, dorsal view. **64.** Bulb, prolateral view. **65.** Fenestra, prolateral view. **66.** Bulb, retrolateral view.

MCZ 72355, PBI_OON 21281), 1♀, Nov. 19, 1957 (A. Chickering, MCZ 72353, PBI_OON 21233), 1♀, Dec. 18, 1963 (A. Chickering, MCZ 72349, PBI_OON 21285), 1♀; Washington Boulevard, Dec. 15, 1963 (A. Chickering, MCZ 72348, PBI_OON 21286), 1♀. *St.*

Catherine: Guanaboa Vale, Nov. 28, 1957 (A. Chickering, MCZ 72366, PBI_OON 26720), 1♂, 1♀; 3 mi E May Pen, Nov. 22, 1957 (A. Chickering, MCZ 72359, PBI_OON 21227), 1♂, 1♀; Old Harbour, "The Whim," Oct. 9, 1957 (A. Chickering, MCZ 72367, PBI_OON



Figs. 67–72. *Opopaea deserticola* Simon, female. 67. Epigastric area, ventral view. 68. Same, detail. 69. Internal genitalia, digested, showing T-shaped sclerotized portion of receptaculum and lateral apodemes, dorsal view. 70. Spinnerets, apical view. 71. Left palp, lateral view. 72. Palpal tarsus, dorsal view.

26718), 1♂, 6♀; 1 mi S Old Harbour, Dec. 7, 1957 (A. Chickering, MCZ 72361, PBI_OON 21229), 1♀; 2 mi W junction Red Hills Road and Spanish Town Road, Nov. 1957 (A. Chickering, MCZ 72365, PBI_OON 26708), 1♂, 6♀; School of Agriculture, Nov. 23, 1957

(A. Chickering, MCZ 72360, 72634, PBI_OON 21226, 26705), 9♂, 20♀; 1.5 mi SW Spanish Town, Oct. 10, 1957 (A. Chickering, MCZ 72362, PBI_OON 21225, 28178), 3♂, 4♀; 5.5 mi W Spanish Town, Dec. 7, 1957 (A. Chickering, MCZ 72368, PBI_OON 26714),

1 ♂; Spanish Town Road at Jamaica School of Agriculture, Oct. 10, 1957 (A. Chickering, MCZ 72363, PBI_OON 21237), 1 ♂, 2 ♀. *St. Thomas*: 6 mi NE Bath, Dec. 10, 1957 (A. Chickering, MCZ 72512, PBI_OON 26929), 1 ♀; 14 mi E Kingston, May 25, 1956, in debris in leaf axils of thatch palms (C. Hoff, MCZ 72369, PBI_OON 26713), 1 ♀; Morant Point, Mammal Bay, Oct. 14, 1957 (A. Chickering, MCZ 72370, PBI_OON 26712), 1 ♂, 2 ♀; Roselle Falls, Oct. 4, 1957 (A. Chickering, MCZ 72395, PBI_OON 26387), 4 ♂, 4 ♀, Oct. 29, 1957 (A. Chickering, MCZ PBI_OON 1077), 2 ♀, Nov. 11, 1957 (A. Chickering, MCZ 72396, PBI_OON 26393), 1 ♀. **Puerto Rico**: Desecheo Island, Feb. 18–20, 1914 (AMNH PBI_OON 1229), 1 ♀; Laguna Cartigano, Valle de Lejas, Jan. 8, 1964 (A. Chickering, MCZ 72383, PBI_OON 26722), 2 ♀; La Parguera, Institute of Marine Biology, Jan. 22, 1964 (A. Chickering, MCZ 72382, PBI_OON 26716), 1 ♂, 2 ♀; Mayagüez, July 2, 1958 (M. Sanderson, AMNH PBI_OON 1196), 1 ♂, Sept. 12, 1959 (A. Nadler, AMNH PBI_OON 1383), 1 ♂, Jan. 13, 1964 (A. Chickering, MCZ 72384, PBI_OON 26709), 1 ♀; Mayagüez, University campus, Jan. 29, 1964 (A. Chickering, MCZ 72380, PBI_OON 26710), 1 ♀; 3 mi S Mayagüez on road to Hormigueros, Jan. 8, 1964 (A. Chickering, MCZ 72376, PBI_OON 26711), 2 ♀; 4.6 mi E Mayagüez on Rt. 106, Jan. 19, 1964 (A. Chickering, MCZ 72385, PBI_OON 26717), 2 ♂, 6 ♀; Nicacos Island, Apr. 3, 1964 (Heatwole, Torres, MCZ 72045, PBI_OON 26674), 1 ♂. **LESSER ANTILLES: Virgin Islands**: *St. Croix*: no specific locality, Mar. 1964 (A. Chickering, MCZ 72516, PBI_OON 28012), 1 ♂, 1 ♀, Sept. 2, 1966 (A. Chickering, MCZ 72445, PBI_OON 26391), 27 ♂, 30 ♀, Sept. 8, 1966 (A. Chickering, MCZ 72510, PBI_OON 28005), 1 ♂, Sept. 9, 1966 (A. Chickering, MCZ 72432, PBI_OON 26381), 25 ♂, 30 ♀; Frederiksted, Mar. 13, 1964 (A. Chickering, MCZ 72436, PBI_OON 21293), 1 ♀, Mar. 14, 1964 (A. Chickering, MCZ 72377, PBI_OON 26385), 1 ♂, 1 ♀, Mar. 15, 1964 (A. Chickering, MCZ 72429, PBI_OON 26376), 3 ♂, 4 ♀, Mar. 19, 1964 (A. Chickering, MCZ 72431, PBI_OON 27492), 2 ♀; 1 mi N Frederiksted, Mar. 16, 1964 (A. Chickering, MCZ 72389, 72545, PBI_OON 26380, 26949), 4 ♂, 10 ♀; 1 mi from Frederiksted on Mahogany

Road, Mar. 23, 1964 (A. Chickering, MCZ 72387, 72527, PBI_OON 21292, 26941), 1 ♂, 5 ♀; 2 mi from Frederiksted on Mahogany Road, Mar. 21, 1964 (A. Chickering, MCZ 72433, PBI_OON 26390), 2 ♂, 1 ♀; King's Hill, Mar. 17, 1964 (A. Chickering, MCZ 72390, PBI_OON 26386), 2 ♂, 1 ♀; vicinity of King's Hill, Mar. 18, 1964 (A. Chickering, MCZ 72386, PBI_OON 26384), 4 ♂, 5 ♀, Mar. 20, 1964 (A. Chickering, MCZ 72439, PBI_OON 26392), 3 ♂, 3 ♀; Lavaetz Garden, 2 mi from Frederiksted, Mar. 24, 1964 (A. Chickering, MCZ 72388, 72441, PBI_OON 21291, 26388), 4 ♂, 16 ♀. *St. John*: no specific locality, July 1966 (A. Chickering, MCZ 72397, PBI_OON 26389), 3 ♂, 16 ♀, July 24, 1966 (A. Chickering, MCZ 72550, PBI_OON 28001), 3 ♀; Annaberg Ruins, Mar. 5, 1964 (A. Chickering, MCZ 72411, PBI_OON 26379), 1 ♂, 3 ♀; Centerline Road, 4 mi from Cruz Bay, Mar. 4, 1964 (A. Chickering, MCZ 72409, PBI_OON 26382), 1 ♂; Coral Bay, Mar. 6, 1964 (A. Chickering, MCZ 72412, PBI_OON 26383), 1 ♂, 1 ♀; Cruz Bay, Feb. 25, 1964 (A. Chickering, MCZ 72393, PBI_OON 21290), 2 ♂, 1 ♀, Feb. 28, 1964 (A. Chickering, MCZ 72391, 72515, PBI_OON 26377, 28015), 2 ♂, 7 ♀, Feb. 29, 1964 (A. Chickering, MCZ 72392, PBI_OON 21294), 2 ♂, 4 ♀, Mar. 7, 1964 (A. Chickering, MCZ 72394, PBI_OON 21289), 3 ♂, 1 ♀. *St. Thomas*: no specific locality, Mar. 9, 1964 (A. Chickering, MCZ 72503, PBI_OON 28020), 1 ♂, 1 ♀, July 1966 (A. Chickering, MCZ 72437, 72444, 72541, PBI_OON 26945, 27486, 37498), 50 ♂, 51 ♀, July 15, 1966 (A. Chickering, MCZ 72513, PBI_OON 28009), 1 ♂, 1 ♀, July 17, 1966 (A. Chickering, MCZ 72547, PBI_OON 28018), 1 ♂, July 27, 1966 (A. Chickering, MCZ 72449, 72525, PBI_OON 27500, 28016), 30 ♂, 31 ♀, Aug. 25, 1966 (A. Chickering, MCZ 72448, PBI_OON 27485), 14 ♂, 27 ♀, Aug. 1966 (A. Chickering, MCZ 72417, 72425, 72542, PBI_OON 26980, 27495, 28003), 50 ♂, 52 ♀, Aug. 10, 1967 (A. Chickering, MCZ 72549, PBI_OON 28019), 1 ♂, 1 ♀; Adams Guest House, Charlotte Amalie, Feb. 11, 1964 (A. Chickering, MCZ 72426, PBI_OON 27504), 6 ♂, 3 ♀; Charlotte Amalie, Feb. 9, 1964 (A. Chickering, MCZ 72442, PBI_OON 27501), 1 ♂, Feb. 9–10, 1964 (A. Chickering, MCZ 72434, PBI_OON 26981), 21 ♂, 15 ♀, Feb. 12, 1964 (A. Chickering, MCZ 72421, 72543,

PBI_OON 26943, 27505), 4♂, 4♀, Feb. 13, 1964, debris, vacant lots (A. Chickering, MCZ 72423, 72430, PBI_OON 27483, 27496, 37530), 32♂, 30♀, Feb. 14, 1964 (A. Chickering, MCZ 72443, 72528, PBI_OON 26947, 27497), 4♀, Feb. 14–15, 1964 (A. Chickering, MCZ 72422, PBI_OON 27484), 8♂, 10♀, Feb. 16, 1964 (A. Chickering, MCZ 72427, 72440, PBI_OON 27493, 27506), 7♂, 16♀, Feb. 19, 1964 (A. Chickering, MCZ 72530, PBI_OON 26948), 1♀, Feb. 19–23, 1964 (A. Chickering, MCZ 72420, PBI_OON 27502), 6♀, Feb. 23, 1964 (A. Chickering, MCZ 72438, 72517, PBI_OON 26979, 28014), 3♂, Feb. 24, 1964, open fields N of city (A. Chickering, MCZ 72419, PBI_OON 26978), 1♂; Charlotte Amalie, grounds of Bluebeards Castle, Feb. 17, 1964 (A. Chickering, MCZ 72424, PBI_OON 27503), 3♀, Feb. 18, 1964 (A. Chickering, MCZ 72428, PBI_OON 27488), 3♂, 1♀; Hassell's Island, Feb. 20, 1964 (A. Chickering, MCZ 72477, PBI_OON 27499), 7♂, 11♀; Hassel's Road, Feb. 20, 1964 (A. Chickering, MCZ 72519, PBI_OON 26944), 3♀; High School Grounds, Charlotte Amalie, Feb. 22, 1964 (A. Chickering, MCZ 72466, 72537, PBI_OON 26946, 27487), 4♂, 8♀, Mar. 10–11, 1964 (A. Chickering, MCZ 72435, PBI_OON 27494, 37529), 9♂, 10♀; Rosendal, N side of mountains, Feb. 21, 1964 (A. Chickering, MCZ 72450, PBI_OON 27498), 1♂. *Tortola*: no specific locality, July 30–Aug. 5, 1966 (A. Chickering, MCZ 72379, PBI_OON 26707), 1♂. *Virgin Gorda*: no specific locality, Aug., 1966 (A. Chickering, MCZ 72521, PBI_OON 28004), 2♀. **LEEWARD ISLANDS**: **Antigua**: no specific locality (Weber, MCZ 72524, PBI_OON 28006), 1♀, Aug. 17–27, 1967 (A. Chickering, MCZ 72526, PBI_OON 28013), 1♂. **Nevis**: no specific locality, Sept. 24–29, 1966 (A. Chickering, MCZ 72523, PBI_OON 28017), 7♂, 13♀. **Saba**: road to Bottom, Oct. 6, 1963, elev. 150 m (MIUP, PBI_OON 240), 1♂. **St. Kitts**: no specific locality, Sept. 14–29, 1966 (A. Chickering, MCZ 72509, 72548, PBI_OON 28010, 37518), 36♂, 59♀, Oct. 1–3, 1966 (A. Chickering, MCZ 72514, PBI_OON 28007, 37532), 12♂, 34♀. **WINDWARD ISLANDS**: **Barbados**: no specific locality (AMNH PBI_OON 1235), 1♀. **St. Vincent**: no specific locality (H. Smith, BMNH), 1♀ (syntype), Oct. 15–24, 1966 (A. Chickering, MCZ 72532,

PBI_OON 28002), 1♂, same dates (A. Chickering, MCZ 72533, PBI_OON 28011), 2♂. **Trinidad**: Curepe, Santa Margarita, Oct. 20, 1974, yellow pan trap (N. Beg, AMNH PBI_OON 1225), 1♂; St. Augustine, University campus, Apr. 1964 (A. Chickering, MCZ 72378, PBI_OON 26715), 10♂, 13♀. **COLOMBIA**: no specific locality (AMNH PBI_OON 1217), 1♂, from orchids (CAS PBI_OON 2925), 1♀. **Bolívar**: Cartagena, Bocagrande, Dec. 22–23, 1964, dry leaf litter at beach (P., D. Craig, CAS 9023418–9023420, PBI_OON 35234, 35248, 35249), 7♂, 5♀. **La Guajira**: Riohacha, Feb. 28, 1974, elev. 0 m (J. Kochalka, AMNH PBI_OON 37058), 1♂, 1♀. **BRAZIL**: **Pará**: 5 km E Belém, May 2, 1974 (R. Schuh, AMNH PBI_OON 10514), 1♂; Goeldi Museu, Belém, Feb. 10, 1959 (A. Nadler, AMNH PBI_OON 10524), 1♀. **Rio de Janeiro**: Botanical Gardens, Rio de Janeiro, Jan. 20, 1959 (A. Nadler, AMNH PBI_OON 10526), 1♀; Saula Teresa, Rio de Janeiro, June 26, 1946 (H. Sick, AMNH PBI 28177), 1♀. **GALAPAGOS ISLANDS**: **Isla Floreana**: South Pampa Grande, Feb. 22, 1977, sweeping in ground cover *Lippia*, elev. 270 m (W. Reeder, TMM 59893, PBI_OON 10525), 1♂; west trail, Feb. 15, 1977, from *Acacia*, elev. 80 m (W. Reeder, TMM 59904, PBI_OON 10531), 1♀, Feb. 16, 1977, sifting slightly damp litter under bower of *Acacia* and *Clerodendrum*, elev. 225 m (W. Reeder, TMM 59906, PBI_OON 10512), 2♀, same date, sifting *Pisonia* litter, elev. 110 m (W. Reeder, TMM 59902, PBI_OON 10504), 1♂, same date sweeping in *Croton*, elev. 225 m (W. Reeder, TMM 59905, PBO_OON 10508), 1♀. **Isla Isabela**: near Villamil, road to Highlands, Aug. 11, 1978, sweeping in *Acacia*, elev. 10–15 m (W. Reeder, TMM 57866, PBI_OON 10435), 1♀; 1 km E Villamil, near peninsula to Loberia, Jan. 31, 1978, sweeping in *Avicennia* canopy, elev. 5 m (W. Reeder, TMM 57863, PBI_OON 10495), 1♂; 5–6 km N Villamil on road to Santo Tomas, Jan. 12, 1977, in decaying cactus trunks on damp sand, elev. 40 m (W. Reeder, TMM PBI_OON 10499), 3♂, 1♀; road from Villamil to Santo Tomas, Jan. 12, 1978, litter in lava crevice beneath *Psidium*, elev. 30 m (W. Reeder, TMM 57849, PBI_OON 10517), 1♂. **Isla San Cristóbal**: Espiñero, Feb. 12, 1975, litter from *Opuntia megaspermum*, flakes of trunk epider-

mis, decayed pads, elev. 50 m (W. Reeder, TMM 57851, PBI_OON 1595), 1♂, 1♀. **Isla Santa Cruz:** trail to Bellavista, Oct. 7, 1975, sifting litter under *Bursera*, elev. 10–12 m (W. Reeder, TMM 57844, PBI_OON 10433), 1♀, Oct. 11, 1975, under rocks and dead *Zanthoxylum* limb, elev. 100 m (W. Reeder, TMM 57854, PBI_OON 10489), 1♀; Darwin Research Station, Academy Bay, Feb. 12, 1964 (D. Cavagnaro, R. Schuster, CAS 9023414, PBI_OON 35233), 1♀.

DISTRIBUTION: Pantropical; in the New World, known from Baja California and Florida south to the Galapagos Islands and Brazil.

SYNONYMY: Chickering (1951) provided no characters to distinguish *O. timida* from *O. deserticola*, and there appears to be none.

Opopaea concolor (Blackwall)

Figures 73–104

Oonops concolor Blackwall, 1859: 265 (male and female syntypes from Madeira, should be in Hope Department of Entomology, Oxford University, but not found there by Zoe Simmons, personal commun.).

Opopaea concolor: Kulczyński, 1899: 339, pl. 6, fig. 25. – Wunderlich, 1987: 63, figs. 24–26. – Saaristo, 2001: 333, figs. 93B–98B. – Saaristo and van Harten, 2006: 137, figs. 22, 23a, 23b, 24a, 24b, 25a, 25b, 26a, 26b, 27. – Saaristo, 2007: 136, figs. 90–92. – Saaristo and Marusik, 2008: 20, figs. 13–21, 119–121, 123–132, 193, 199, 218, 228.

Myrmecoscaphiella borgmeyeri Mello-Leitão, 1926: 2 (male holotype from Rodeio, Santa Catarina, Brazil, in MNRJ, examined). **NEW SYNONYMY.**

Opopaea devia Gertsch, 1936: 5, fig. 13 (female holotype from Edinburg, Hidalgo Co., Texas, in AMNH, examined). **NEW SYNONYMY.**

Opopaea guaraniana Birabén, 1954: 203, figs. 30–36, 50 (female holotype and male allotype from Manantiales, Corrientes, Argentina, lost). **NEW SYNONYMY.**

Opopaea bandina Chickering, 1969: 147, figs. 1–3 (female holotype from Largo, Pinellas Co., Florida, in MCZ, examined). **NEW SYNONYMY.**

Gamasomorpha atlantica Benoit, 1977: 35, figs. 13a–e (male holotype from Prosperous Bay Plain, Saint Helena, in Musée Royal de l'Afrique Centrale, not examined). First synonymized by Saaristo and Marusik, 2008: 20.

Opopaea atlantica: Brignoli, 1983: 188.

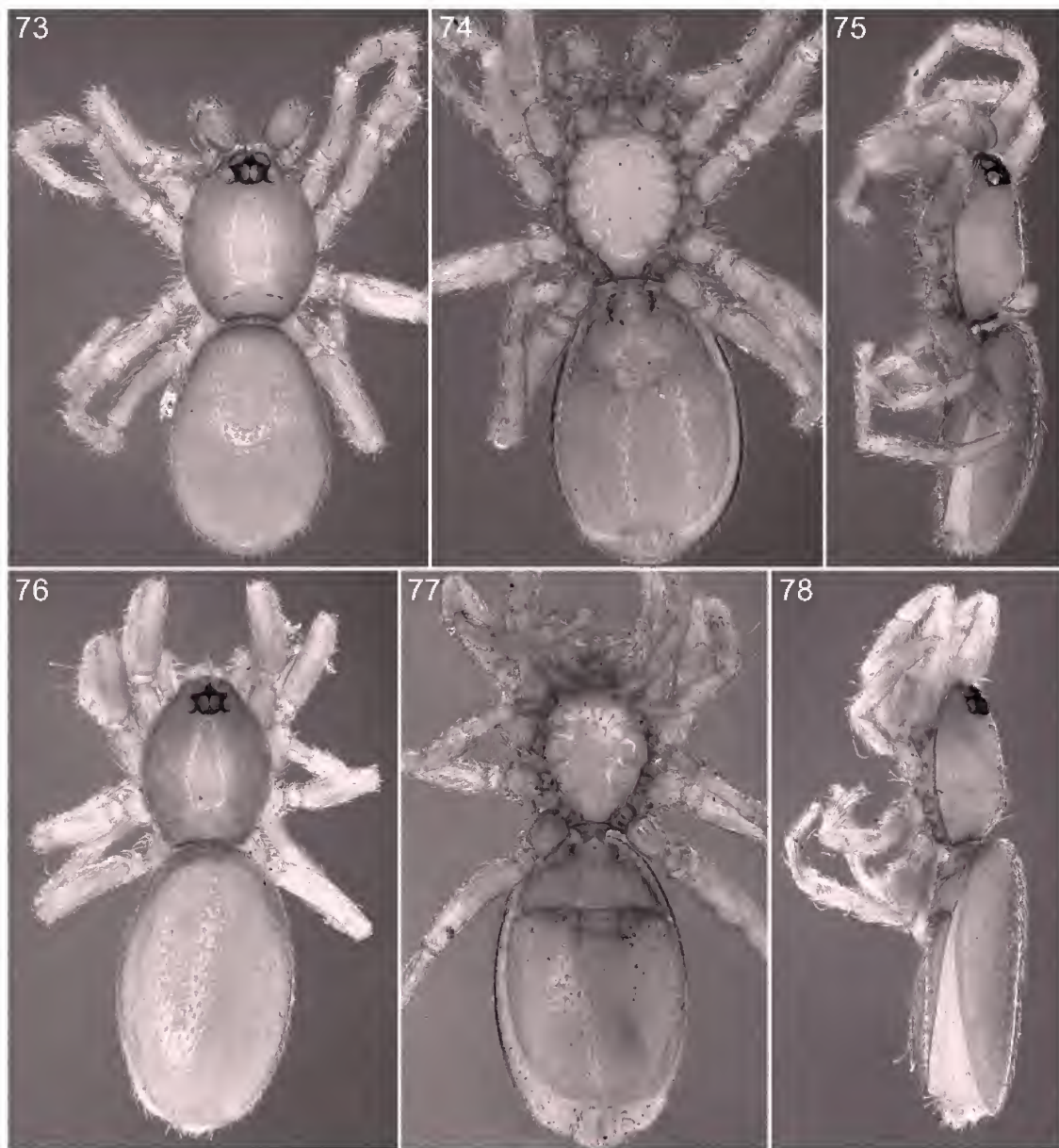
DIAGNOSIS: Males can be distinguished from those of *O. deserticola* by the ventrally unexpanded palpal bulb (figs. 93–96, 99–104), females by having the small, dark knob marking the origin of the receptaculum

situated quite far from the epigastric furrow (figs. 91, 92, 97, 98).

MALE (PBI_OON 1058). Total length 1.23, habitus as in figs. 73–75. As in *O. deserticola* except as noted. **CEPHALOTHORAX** (figs. 79–81, 87): pars cephalica pores, serrula not scanned. **ABDOMEN** (figs. 82, 89): setae and outgrowths near pedicel not scanned. **LEGS:** tibial glands and pores, tarsal claw dentition, trichobothria and tarsal organs not scanned. **GENITALIA:** Palpal trichobothria not scanned. Bulb not expanded ventrally (figs. 93–96, 99–104).

FEMALE (PBI_OON 1213). Total length 1.47, habitus as in figs. 76–78. As in female of *O. deserticola* except as noted. **CEPHALOTHORAX** (figs. 83–85, 88): Palpal trichobothria not scanned. **ABDOMEN** (figs. 86, 90): Spinnerets not scanned. **LEGS:** Not scanned. **GENITALIA:** Ventral view: epigastric region with protruding knob situated posterior of epigastric furrow (figs. 91, 97). Dorsal view: sclerotized portions of receptaculum short, T-shaped, originating well posterior of epigastric furrow (figs. 92, 98).

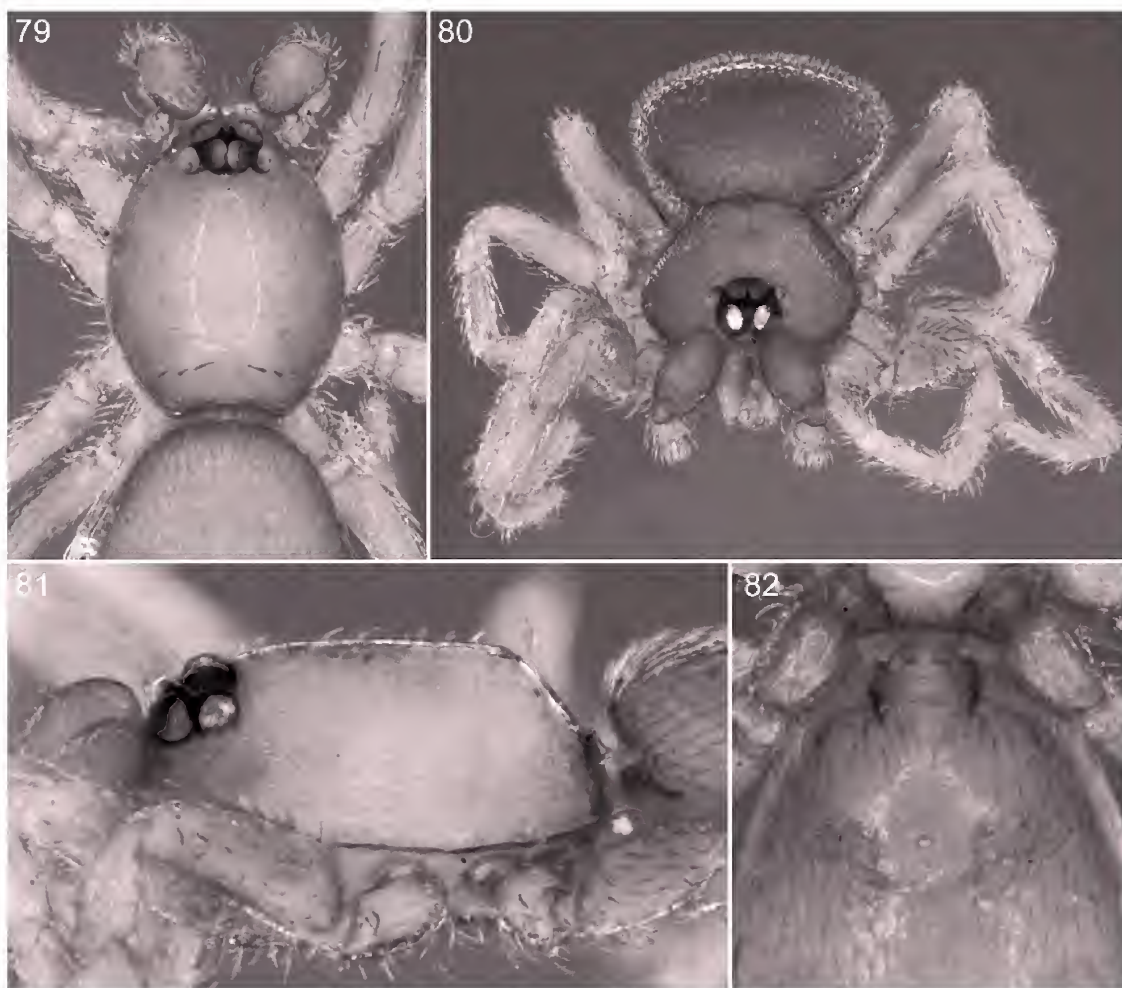
MATERIAL EXAMINED: **UNITED STATES:**
Arizona: *Yuma Co.:* Yuma, Apr. 1, 1960, running across patio at noon (V. Roth, AMNH PBI_OON 1214), 1♂. **California:** *Los Angeles Co.:* no specific locality, Dec. 1954, in termite-infested wood (AMNH PBI_OON 31056), 1♂; Hermosa Beach, Mar. 18, 1941 (W. Ivie, AMNH PBI_OON 31058), 1♂; Westwood, Los Angeles Basin, Apr. 19, 1955, in termite-infested wood (R. Pence, AMNH PBI_OON 1193), 1♂. *Riverside Co.:* Riverside Agricultural Experiment Station, Oct. 7, 2002, in yellow jacket traps in citrus and eucalypt (R. Vetter, CAS 9023427, PBI_OON 3750), 1♂. **District of Columbia:** Washington, U. S. National Museum Building, room 83, Dec. 27, 1934 (C. Shoemaker, USNM 2046648, PBI_OON 27934), 1♀. **Florida:** *Alachua Co.:* Gainesville (AMNH PBI_OON 1982), 1♀, Apr. 9, 1979, in cloth-sealed package from Argentina (L. Strange, FSCA PBI_OON 21189), 1♀; Science Hall, Univ. of Florida, Gainesville, Dec. 6, 1948, bookcase (AMNH PBI_OON 1208), 1♂ (missing both palpal bulbs), 1♀. *Glades Co.:* near Harrisburg, Apr. 1956, bromeliad in cypress trees (C. Hoff, AMNH PBI_OON 1275), 1♀. *Highlands Co.:*



Figs. 73–78. *Opopaea concolor* (Blackwall), habitus. 73–75. Male. 76–78. Female. 73, 76. Dorsal view. 74, 77. Ventral view. 75, 78. Lateral view.

Archbold Biological Station, Lake Placid, Nov. 23, 1952 (A. Nadler, AMNH PBI_OON 1204), 1♀, Dec. 8, 1959 (A. Nadler, AMNH PBI_OON 1195), 1♀, Oct. 1, 1962 (A. Nadler, AMNH PBI_OON 1194), 1♀, July 3–8, 1978, litter, elev. 20 m (J., F. Murphy, AMNH PBI_OON 36544, 36545), 2♂; De Soto City, Oct. 5, 1962 (A. Nadler, AMNH

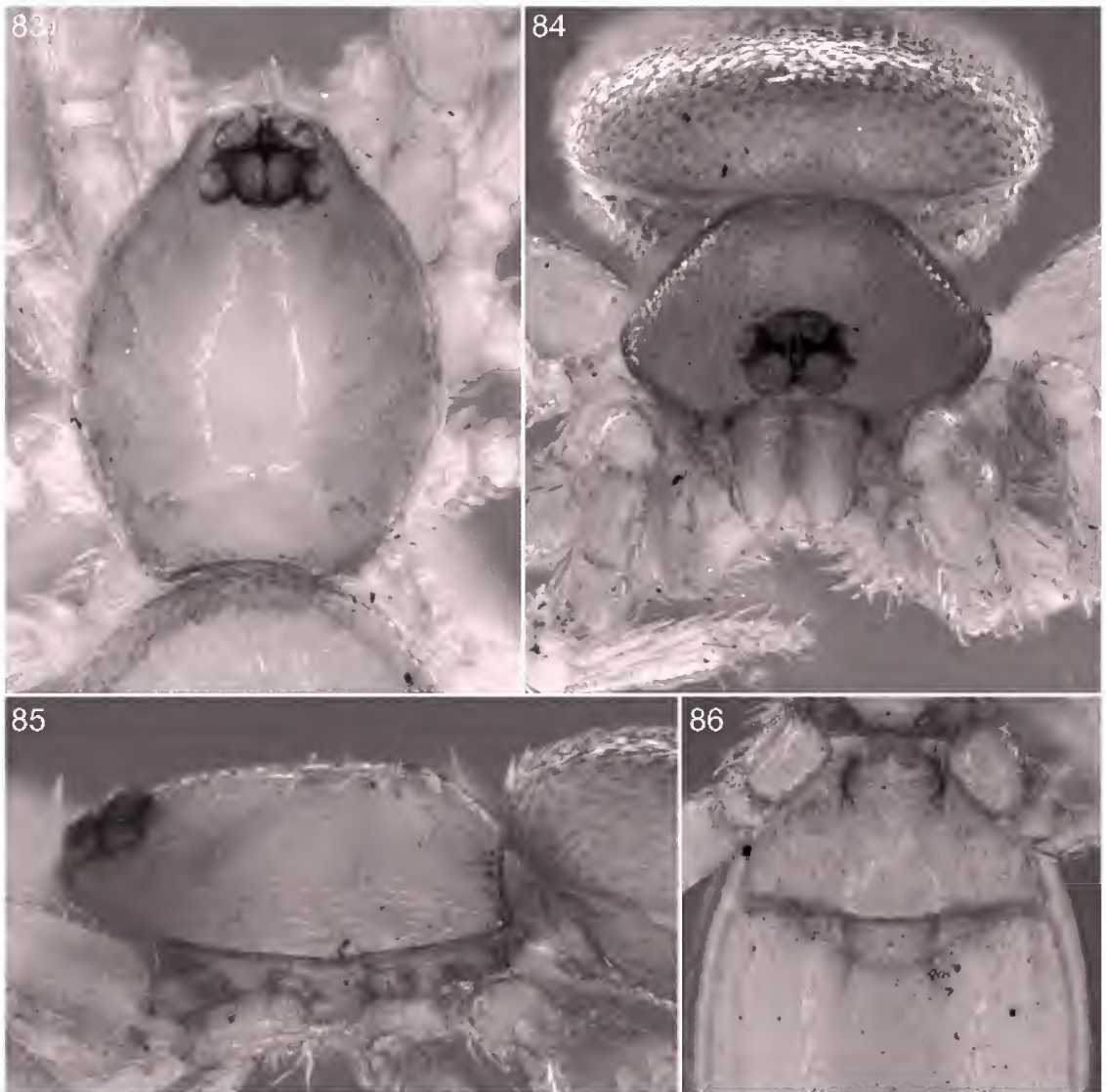
PBI_OON 1202), 1♀; Highlands Hammock State Park, along County Road, N boundary, Apr. 5, 1966, palmetto pine/pine swamp forest (J. Wagner, FMNH PBI_OON 37515), 1♂. *Indian River Co.*: no specific locality, Australian pine (K. Hibbard, R. Kendrick, FSCA PBI_OON 21187), 1♀. *Lee Co.*: Fort Myers Beach, 26°26'N, 81°56'W, Mar. 17,



Figs. 79–82. *Opopaea concolor* (Blackwall), male. 79. Cephalothorax, dorsal view. 80. Same, anterior view. 81. Same, lateral view. 82. Epigastric area, ventral view.

1954 (W. Ivie, AMNH PBI_OON 31054), 1♀. *Okeechobee Co.*: Kissimmee Prairie Preserve State Park, Jan. 1977, bromeliad leaves (D. Strohmeier, AMNH PBI_OON 31055), 1♂. *Orange Co.*: 3 mi NW Maitland, 28°38'N, 81°24'W, Dec. 10, 1962 (W. Ivie, AMNH PBI_OON 1292), 1♀. *Pinellas Co.*: Largo, May 1964 (L. Levi, MCZ), 1♀ (holotype). *Sarasota Co.*: Myakka River State Park, 27°14'N, 82°16'W, Dec. 26, 1963 (J., W. Ivie, AMNH PBI_OON 1263), 2♂, 1♀. *Saint Lucie Co.*: Bluefield, Aug. 24, 1983, on Casuarina (K. Hibbard, FSCA PBI_OON 21184), 1♂, Dec. 14, 1983, on pine (K. Hibbard, FSCA PBI_OON 21190), 1♀; White City, Aug. 11, 1983, on Casuarina (K.

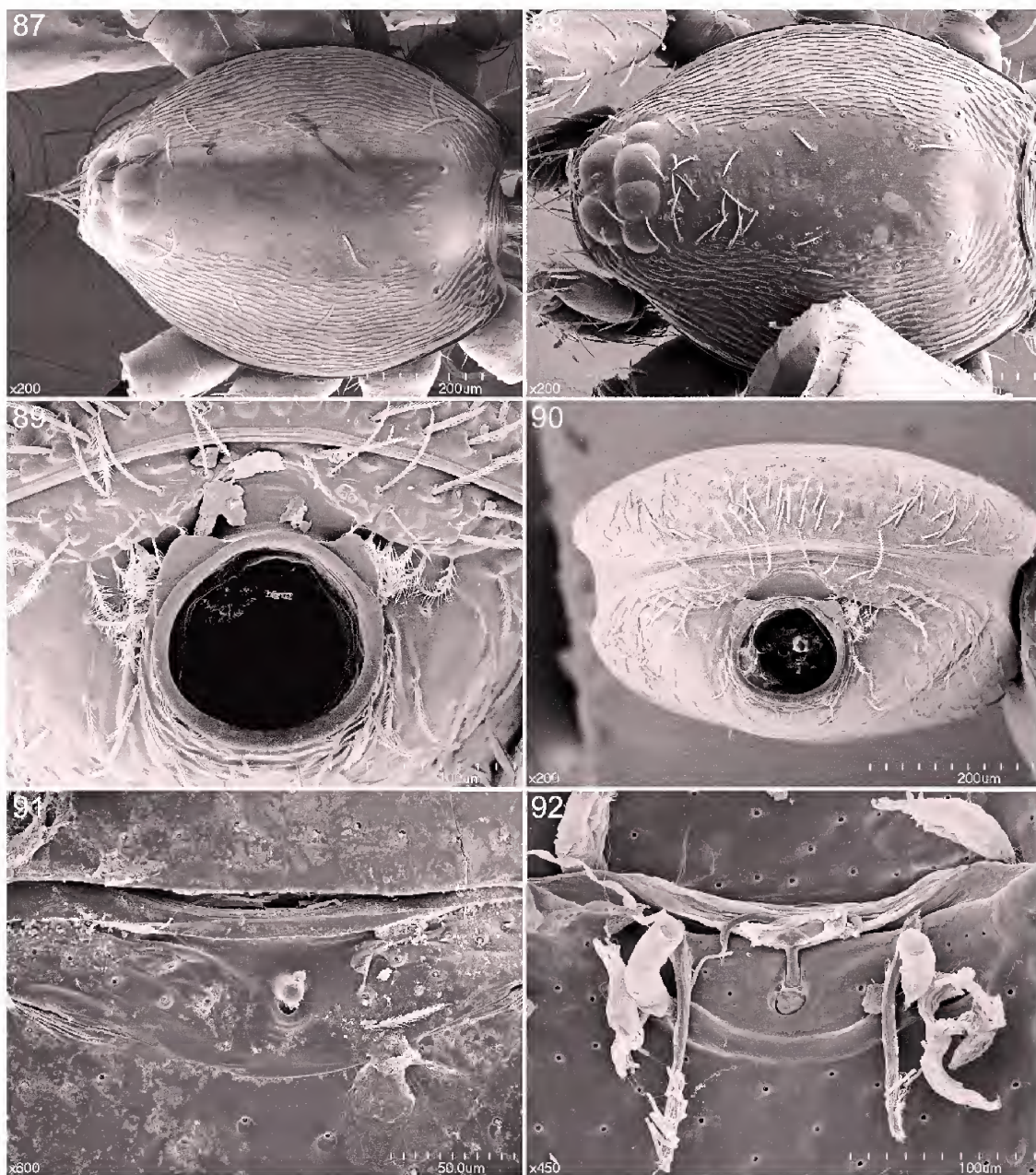
Hibbard, FSCA PBI_OON 21188), 1♀. *Volusia Co.*: Edgewater, Feb. 28, 1939 (C. Frost, MCZ 66783, PBI_OON 26767), 2♀. **Texas**: *Hidalgo Co.*: Edinburg, Dec. 1–10, 1926 (S. Mulaik, AMNH PBI_OON 1213), 1♀, May 30, 1935 (S. Mulaik, AMNH PBI_OON 31057), 1♀ (holotype), Mar. 1939 (E. Atwood, AMNH PBI_OON 1219), 1♀; 3 mi E Edinburg, Apr. 12, 1937 (S. Mulaik, AMNH PBI_OON 1211), 1♀; 7 mi S Pharr, May 30, 1939 (S. Mulaik, AMNH PBI_OON 1215), 1♂. **MEXICO**: **Baja California Sur**: Rancho de Parras, 12 mi S Loreto, Jan. 29, 1965 (V. Roth, AMNH PBI_OON 1986), 1♀. **Guerrero**: Ayotzinapa, Jan. 14, 1941 (F. Bonet, AMNH PBI_OON 1373), 1♂.



Figs. 83–86. *Opopaea concolor* (Blackwall), female. **83.** Cephalothorax, dorsal view. **84.** Same, anterior view. **85.** Same, lateral view. **86.** Epigastric area, ventral view.

Hidalgo: Taxquillo, Tzindejeh, Río Tula, 20°33'N, 99°19'W, Aug. 20, 1964 (J., W. Ivie, AMNH PBI_OON 1369, 1409), 5 ♂, 4 ♀, July 29, 1966 (J., W. Ivie, AMNH PBI_OON 1395), 1 ♂, 1 ♀. **Nayarit:** Compostela, July 26, 1954 (W. Gertsch, AMNH PBI_OON 1394), 1 ♂. **Oaxaca:** Tlacolula, 16°57'N, 96°27'W, Apr. 30, 1963, under cliff (W. Gertsch, W. Ivie, AMNH PBI_OON 1393, 9 ♂, 1 ♀. **Sinaloa:** 6 mi S Culiacán, July 22, 1954 (W. Gertsch, AMNH PBI_OON 1415), 1 ♂. **COSTA RICA:** no specific locality,

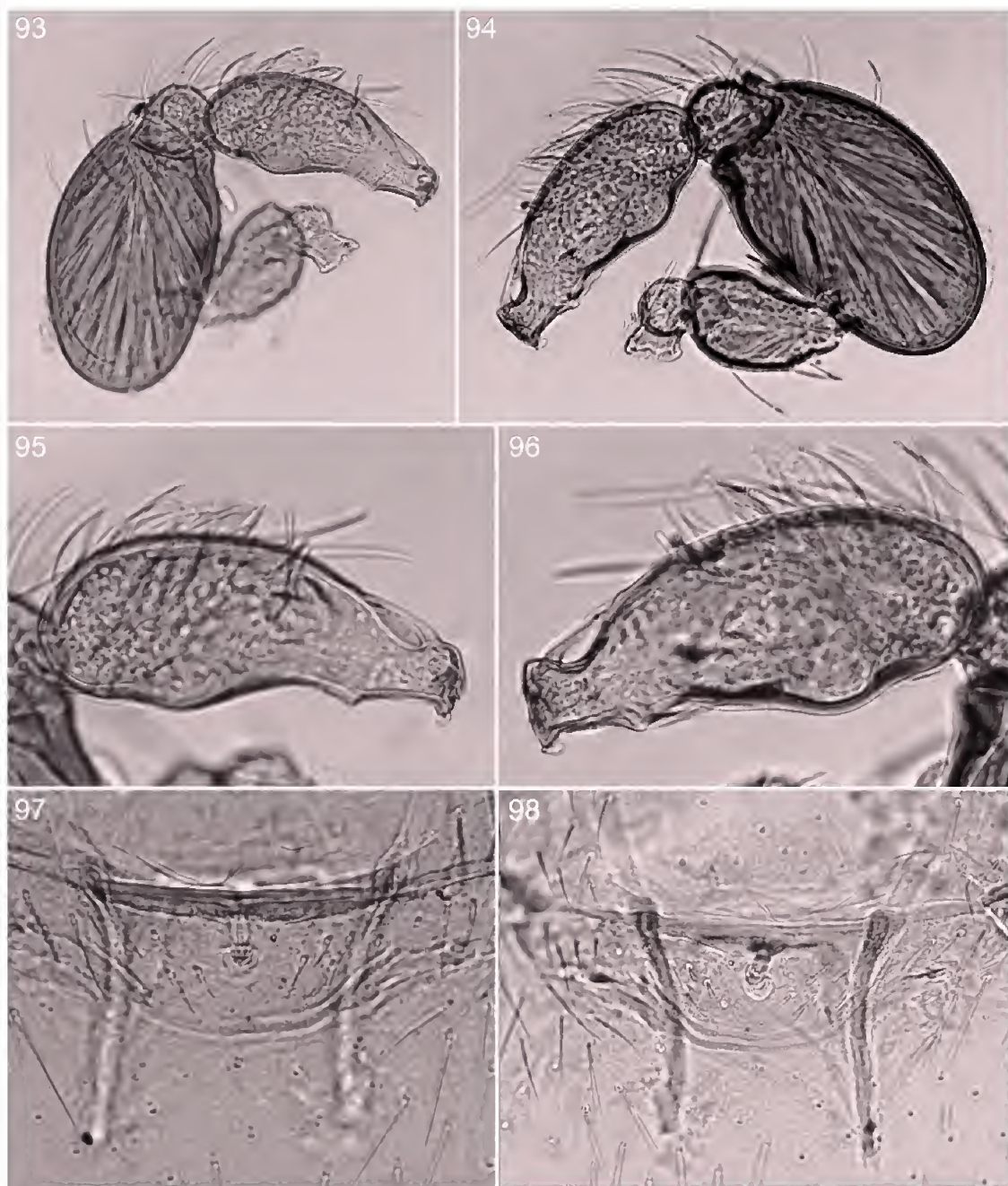
intercepted at New Orleans, Louisiana, June 1, 1936, USNM 2046648, PBI_OON 27926), 1 ♀. **Alajuela:** Alfaro Ruiz, Zarcero, Mar. 18, 1997, elev. 1600–1700 m (INBIO 2805767, PBI_OON 29668), 1 ♂. **Heredia:** Llorente, Flores coffee plantation, Feb. 11, 2007, dead leaves (C. Viquez, AMNH PBI_OON 29679), 1 ♀; INBIO, Santo Domingo, June 23, 1997, in book (A. Solis, C. Viquez, INBIO 47179, PBI_OON 29678), 1 ♀. **San José:** San Joaquín, June 9, 1997 (C. Viquez, AMNH PBI_OON 37516), 1 ♀. **WEST INDIES:** **Bahama Islands:**



Figs. 87–92. *Opopaea concolor* (Blackwall), SEM. 87, 89. Male. 88, 90–92. Female. 87, 88. Carapace, dorsal view. 89, 90. Abdomen, anterior view, showing triangular projections on pedicel and plumose hairs near them. 91. Epigastric area, ventral view. 92. Same, digested, showing T-shaped sclerotized portion of receptaculum and lateral apodemes, and basal portion of tracheal trunks, dorsal view.

South Bimini, May 1951 (W. Gertsch, M. Cazier, AMNH PBI_OON 1249), 2♀. GREATER ANTILLES: **Cuba:** *La Habana:* San Antonio de los Baños, June 18, 2003, in house (G. Alayón, AMNH PBI_OON 241),

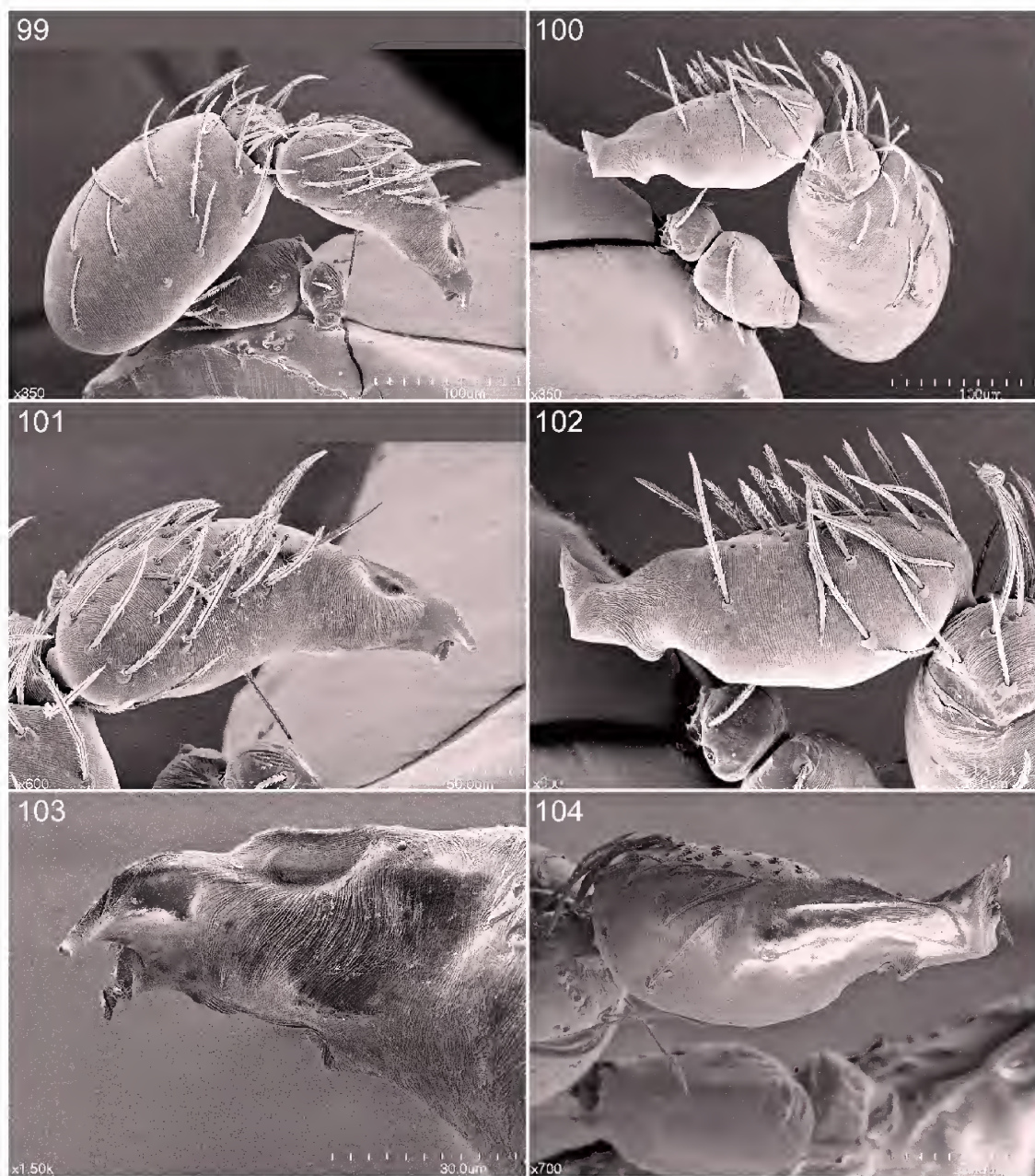
1♂ **Jamaica:** *St. Andrew:* Mona, 1953, grass and bushes (G. Underwood, MCZ 72281, PBI_OON 26677), 1♀. **COLOMBIA:** **Magdalena:** Punta Betín, Santa Marta, Nov.–Dec. 1985, pitfalls (H. Müller, MHNG



Figs. 93–98. *Opopaea concolor* (Blackwall), compound microscope. 93–96. Male palp. 97, 98. Female epigastric region. 93. Prolateral view. 94. Retrolateral view. 95. Bulb, prolateral view. 96. Bulb, retrolateral view. 97. Ventral view. 98. Dorsal view.

PBI_OON 15780), 5♂, 4♀. BRAZIL: **Santa Catarina:** Rodeio, in nest of *Eciton* army ants (T. Borgmeyer, MNRJ), 1♂ (holotype). ARGENTINA: **Capital Federal:** Buenos

Aires, Oct. 29, 1984 (M. Ramírez, MACN 15300, PBI_OON 14772), 1♂. **Misiones:** Dieciséis de Octubre, Oct. 1953 (De Carlo, R. Schiapelli, Viana, M. Galiano, MACN



Figs. 99–104. *Opopaea concolor* (Blackwall), male palp, SEM. 99–102. Left palp. 103, 104. Right palp, holotype, *Myrmecoscapbiella borgmeyeri*, uncoated. 99. Prolateral view. 100. Retrolateral view. 101, 103. Bulb, prolateral view. 102, 104. Bulb, retrolateral view.

3780, PBI_OON 14771), 2♂, 5♀, Nov. 1, 1954 (R. Schiapelli, MACN 15301, PBI_OON 14773), 1♂. ECUADOR: **Guayas:** Guayaquil, Jan. 1943 (H. Exline, D. Frizzell, CAS 9023415, PBI_OON 35235), 1♀. GALAPAGOS ISLANDS: **Isla Isabela:** Beagle Crater Camp,

May 21, 1980, sifted from finch and mockingbird nests (W. Reeder, TMM 59884, PBI_OON 37513), 2♂, 2♀. **Isla San Cristóbal:** Cerro Pelado, Feb. 17, 1978, extracted from fronds of large bromeliads, elev. 440 m (W. Reeder, TMM 59898, PBI_OON 37514), 1♀. PERU:

Piura: near Mallares, Río Chira, Dec. 31, 1941 (H. Exline, D. Frizzell, CAS 9023423, PBI_OON 36251), 1 ♂, Jan. 4, 1942 (H. Exline, D. Frizzell, CAS 9023421, PBI_OON 35236), 3 ♂, 2 ♀; 12 mi N Máncora, Dec. 11, 1938 (H. Exline, D. Frizzell, CAS 9023422, PBI_OON 35238), 1 ♂; Negritos, May 23, 1941 (H. Exline, D. Frizzell, CAS 9023425, PBI_OON 36237), 1 ♀; Pariñas Valley, N Negritos, Sept. 24, 1938 (H. Exline, D. Frizzell, CAS 9023424, PBI_OON 35250), 1 ♂, 1 ♀. **MADEIRA:** **Madeira:** Cruz Museum, Funchal, Oct. 2, 1964 (A. Nadler, AMNH PBI_OON 1411), 1 ♀; Funchal, Apr. 16, 1973, grassy cliffs, elev. 10 m (AMNH PBI_OON 36438), 1 ♀. **ST. HELENA:** no specific locality, Oct. 2003 (AMNH PBI_OON 36434), 1 ♂, 1 ♀. **HAWAII:** **Oahu:** Honolulu, Oct. 1951, in flour in house (D. Hardy, AMNH PBI_OON 1444), 2 ♀.

DISTRIBUTION: Pantropical; in the New World, known from the southern United States and Bahama Islands south to the Galapagos Islands, Peru, and Argentina. The type specimens of this species were captured "in a house among loose papers" on the island of Madeira (Blackwall, 1859: 266). The species is obviously synanthropic; although probably native only to the Old World, it can today be found throughout both the Old and New World tropics and subtropics (sometimes sympatrically with *O. deserticola*).

SYNONYMY: No differences from *O. concolor* (or from each other) were noted in the original descriptions of *Myrmecoscaphiella borgmeyeri*, *O. devia*, or *O. bandina*, and none were detected during examination of their holotypes (figs. 103, 104). The types of *O. guaraniana*, originally deposited in the personal collection of Birabén, are apparently lost; although other types from that paper are now in the La Plata or Buenos Aires collections, these specimens are not among them (C. Grismado, personal commun.). Birabén's illustration of the female genitalic region leaves no doubt that his specimens belonged to *O. concolor*.

Epectris Simon

Epectris Simon, 1893b: 74 (type species by monotypy *Epectris apicalis* Simon).

Nale Saaristo and Marusik, 2008: 39 (type species by original designation *Opopaea lena* Suman). **NEW SYNONYMY.**

DIAGNOSIS: Because the type species of this genus has been known only from females, and no illustrations were provided by Simon (1893b), the identity and relationships of the taxon have remained obscure. Simon did recognize the affinity of *Epectris apicalis* with *Opopaea*, and might well have placed the species in *Opopaea* instead had he known that the male palpal patella shares the synapomorphies of that genus. However, Simon (1893a) separated *Epectris* from *Opopaea* on the basis of its more procurved posterior eye row (figs. 111, 113, 115, 117). Males can easily be separated from those of *Opopaea* by the presence of a long basal protrusion on the palpal bulb (fig. 151), and both sexes have a posterior dark spot on the abdominal dorsum (figs. 105, 108) that is lacking in *Opopaea*, but these differences, like those in the eye pattern, may be just highly autapomorphic characters of the type species (see below, under Synonymy).

DESCRIPTION: A description has been provided by Saaristo and Marusik (2008: 39, as *Nale*).

MISPLACED SPECIES: Two modern species have been placed in the genus: *Epectris aenobarbus* Brignoli (1978) from Bhutan and *Epectris conujaingensis* Xu (1986) from China, but it is clear from the palpal illustrations provided by those authors that both of those species are misplaced, and are not congeneric with the type species of either *Epectris* or *Opopaea*. The only other species currently assigned to the genus is *Epectris mollis* Simon (1907), based on a female from Sri Lanka; Simon provided no illustrations, but his indication that the abdomen lacks scuta shows that this species is also misplaced, possibly even at the subfamily level. The affinities of all three taxa will remain uncertain until their types can be examined in the course of revisionary studies on Old World oonopids.

SYNONYMY: Saaristo and Marusik (2008) removed *O. lena* from *Opopaea* and placed it in the monotypic new genus *Nale*, arguing that the remaining species of *Opopaea* are united by a palpal fenestra that is lacking in *O. lena*. Because *O. lena* is a junior synonym of the type

species of *Epectris*, *Nale* is here placed as a junior synonym of *Epectris*. We suspect that *E. apicalis* is just a highly autapomorphic species of *Opopaea*, rather than its sister group, and that *Epectris* and *Nale* may both therefore be junior synonyms of *Opopaea*. A decision on that question should wait until the Old World fauna is fully revised and the relationships of *E. apicalis* and the many species of *Opopaea* can be analyzed in detail, using both morphological and molecular data. It seems likely, though, that *E. apicalis* does actually have a palpal fenestra (see figs. 155, 156).

Epectris apicalis Simon

Figures 105–160

Epectris apicalis Simon, 1893b: 74 (female holotype from Antipolo, Luzon, Philippines, in MNHN, examined).

Opopaea lena Suman, 1965: 227, figs. 9–14 (male holotype from Kailua, Oahu, Hawaii, in Bishop Museum, not examined). – Saaristo, 2001: 337, figs. 112A–C, 113–117. – Burger et al., 2003: 90, fig. 23. – Baert et al., 2008: 56. NEW SYNONYMY.

Gamasomorpha ladiguei Benoit, 1979: 198, fig. 4A–D (female holotype from Mont La Digue, La Digue, Seychelle Islands, in Tervuren, examined by Michael Saaristo). First synonymized with *O. lena* by Saaristo, 2001: 337.

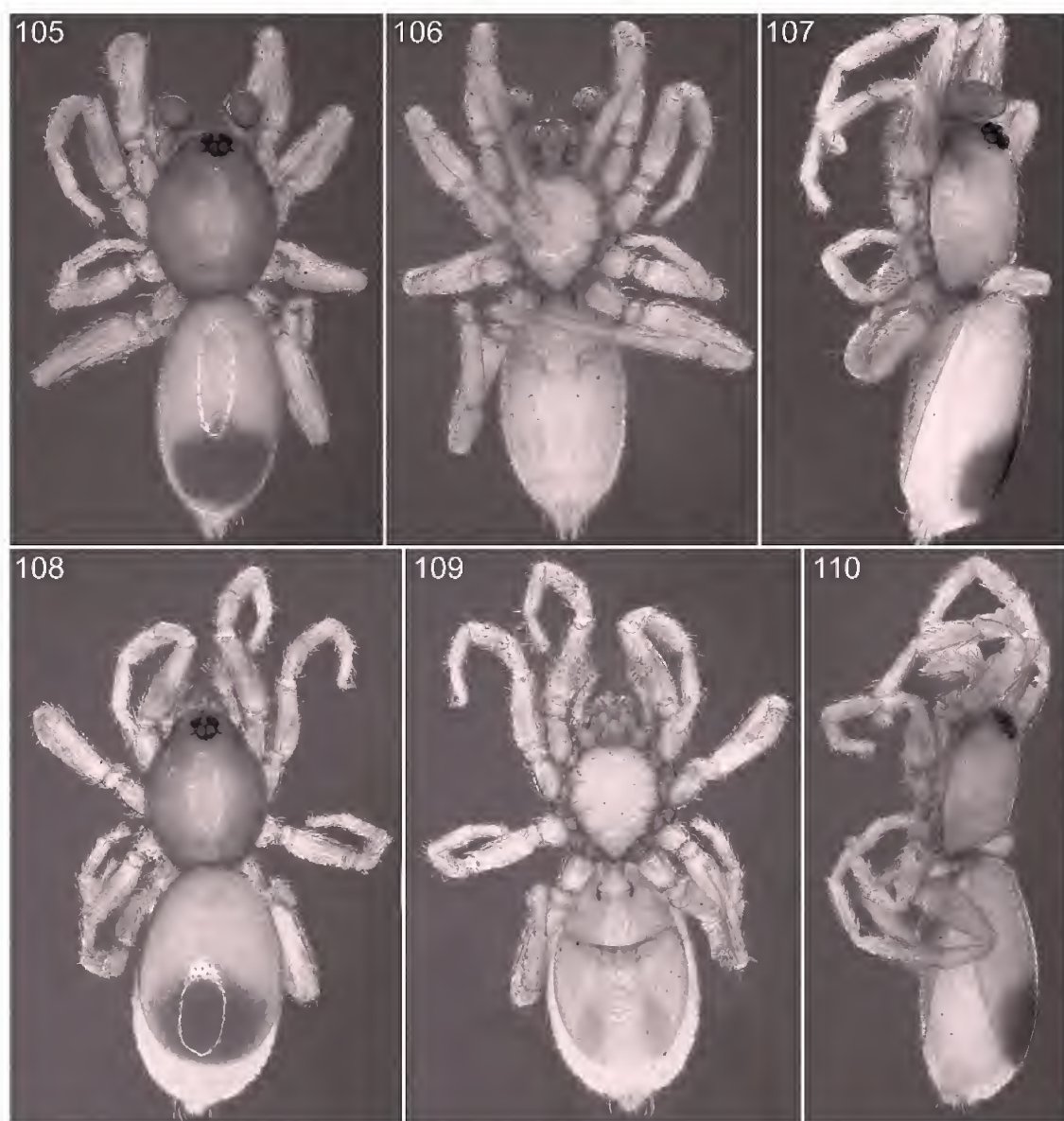
Opopaea mortenseni Brignoli, 1980: 6, fig. 3 (female holotype from Lem Ngob, Thailand, in Copenhagen, examined by Michael Saaristo). First synonymized with *O. lena* by Saaristo, 2001: 337.

Nale lena: Saaristo and Marusik, 2008: 39, figs. 112–118, 170–177, 179–185, 197, 201, 215, 229.

DIAGNOSIS: This distinctive species is easily recognized by the dark spot at the posterior end of the abdominal dorsum (figs. 105, 108), the long, basal protrusion on the palpal bulb (fig. 151), and the inverted V-shaped sclerotization in the female genitalic area (figs. 149, 158).

MALE (PBI_OON 26956). Total length 1.12, habitus as in figs. 105–107. **CEPHALOTHORAX:** *Carapace* pale orange, without any pattern, elongate oval in dorsal view (fig. 111), pars cephalica slightly elevated in lateral view (fig. 112), anteriorly narrowed to 0.49 times its maximum width or less; posterolateral corners angular, posterolateral edge without pits, posterior margin not bulging below posterior rim (fig. 114); anterolateral corners without extension or projections; posterolateral surface without spikes; lateral margins straight, rebordered, without

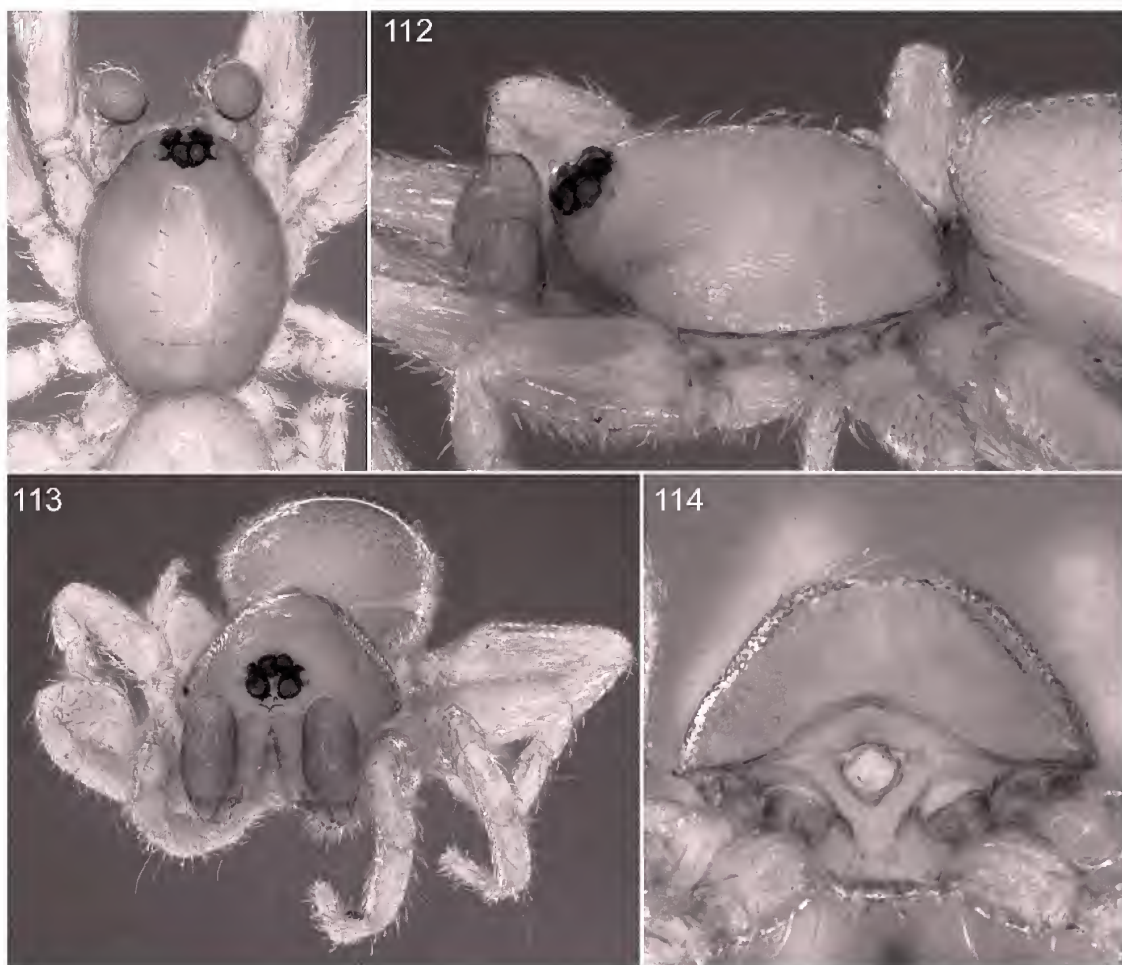
denticles; surface of elevated portion of pars cephalica smooth (fig. 119), sides striated (fig. 120); deep depressions absent, fovea absent, pars thoracica without radiating rows of pits; nonmarginal pars cephalica setae dark, needlelike, in U-shaped row; nonmarginal pars thoracica setae dark, needlelike; marginal setae dark, needlelike; sides of pars cephalica with scattered pores set in slight depressions (as in fig. 126). *Clypeus:* Margin unmodified, curved downwards in front view, vertical in lateral view, high, ALE separated from edge of carapace by their radius or more, median projection absent; setae dark, needle-like. *Chilum:* Absent. *Eyes:* Six, well developed, all subequal; ALE oval, PME squared, PLE oval; posterior eye row procurved from both above and front (fig. 113); ALE separated by their radius to diameter, ALE-PLE separated by less than ALE radius, PME separated by less than their radius, PLE-PME separated by less than PME radius. *Sternum:* Longer than wide, pale orange, uniform, fused to carapace, median concavity absent; radial furrows present between coxae I–II, II–III, III–IV, wrinkled, radial furrow opposite coxae III absent; surface smooth, without pits, microsculpture only in furrows, sickle-shaped structures not touching, anterior margin with semicircular depression in middle half (fig. 122), posterior margin not extending posteriorly of coxae IV; anterior corner unmodified, lateral margin with infracoxal grooves connecting anterior and posterior openings, distance between coxae II and III greater than distance between coxae I and II, or coxae III and IV, precoxal triangles absent, lateral margins with rounded extensions between coxae, without posterior hump; setae sparse, dark, needlelike, densest laterally, originating from surface; hair tufts absent. *Mouthparts:* Chelicerae, endites, and labium pale orange. Chelicerae straight, anterior face unmodified; promargin without teeth, retromargin without teeth; fang tooth-like projections absent, fang directed medially, shape normal, without prominent basal process, tip unmodified; setae dark, needlelike, evenly scattered; paturon inner margin with scattered setae, distal region unmodified, promargin unmodified, inner margin unmodified, laminate groove absent. Labium triangular, fused to sternum, with anterior margin



Figs. 105–110. *Epectris apicalis* Simon, habitus. 105–107. Male. 108–110. Female. **105, 108.** Dorsal view. **106, 109.** Ventral view. **107, 110.** Lateral view.

indented at middle, same as sternum in sclerotization; six or more setae present on anterior margin, subdistally with unmodified setae. Endites distally not excavated, serrula present in single row (as in fig. 128), anteromedian tip with one strong, rounded, toothlike projection (fig. 121), posteromedian part unmodified, same as sternum in sclerotization. ABDOMEN: cylindrical, without long

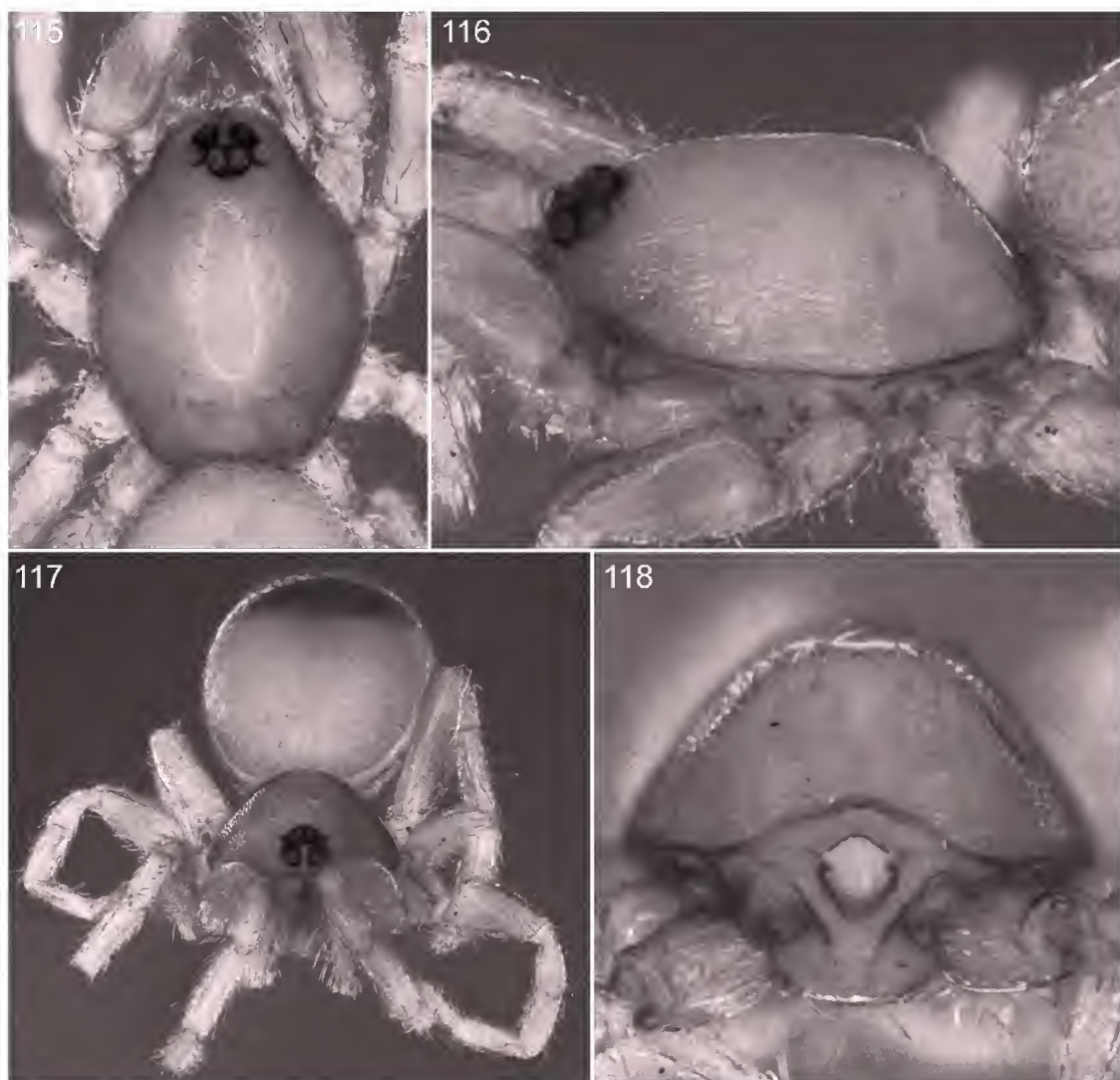
posterior extension, rounded posteriorly, interscutal membrane without rows of small sclerotized platelets; soft portions white, without color pattern. Book lung covers large, ovoid, without setae, anterolateral edge unmodified. Posterior spiracles connected by groove. Pedicel tube short, ribbed, scuto-pedicel region with paired curved scutal ridges (fig. 129), scutum not extending far dorsal of



Figs. 111–114. *Epectris apicalis* Simon, cephalothorax, male. **111.** Dorsal view. **112.** Lateral view. **113.** Anterior view. **114.** Posterior view.

pedicel, plumose hairs absent, matted setae on anterior ventral abdomen in pedicel area absent; cuticular outgrowths near pedicel absent. Dorsal scutum strongly sclerotized, pale orange, with one dark spot at posterior half, covering full length of abdomen, no soft tissue visible from above, not fused to epigastric scutum, middle surface punctate, sides punctate, anterior half without projecting denticles. Epigastric scutum surrounding pedicel, not protruding, small lateral sclerites absent. Postepigastric scutum strongly sclerotized, pale orange, long, semicircular, covering nearly full length of epigastric area, fused to epigastric scutum, anterior margin unmodified, with short posteriorly directed lateral apodemes. Spinneret scutum present, incom-

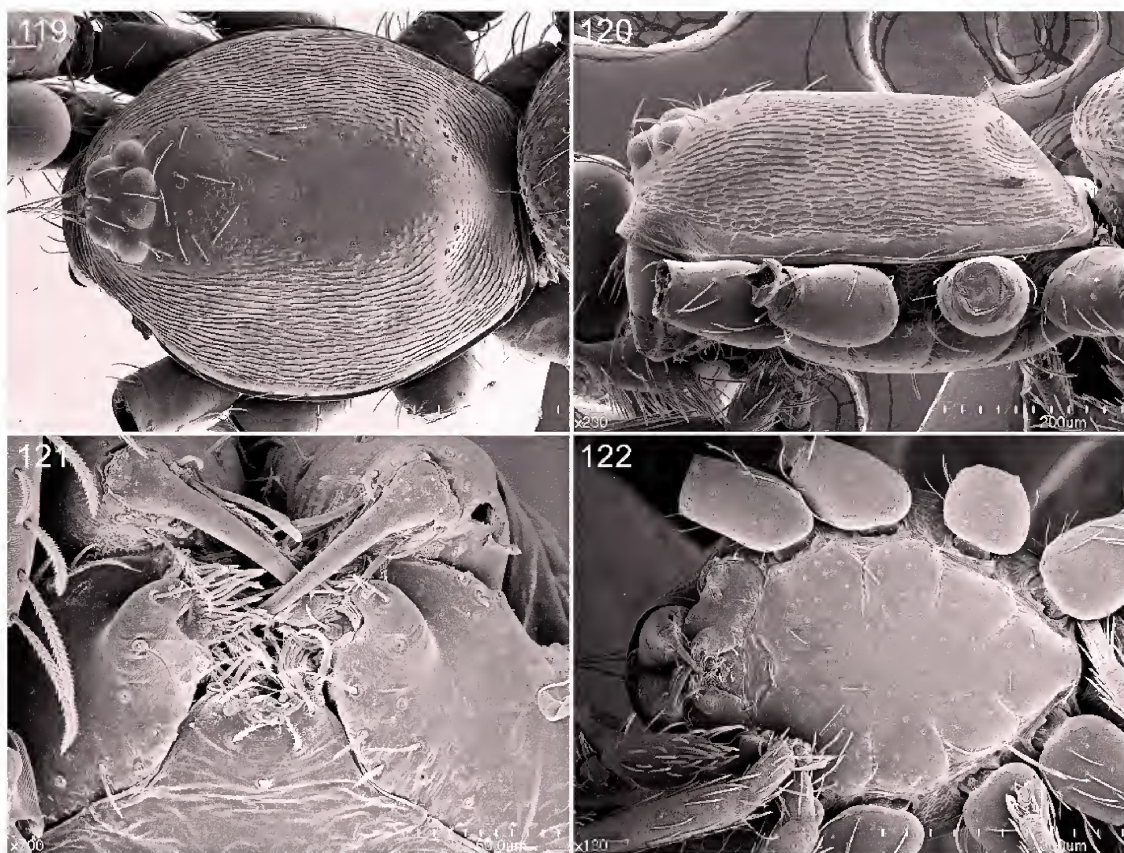
plete ring. Supra-anal scutum absent. Dorsum setae light, needlelike. Epigastric area setae uniform, dark, needlelike. Postepigastric area setae light, needlelike. Spinneret scutum with fringe of long setae. Interscutal membrane with setae. Dense patch of setae anterior to spinnerets absent. Colulus present. **LEGS:** yellow, without color pattern. Femur IV not thickened, patella plus tibia I shorter than carapace, tibia I unmodified, tibia I Emerit's glands absent, tibia IV specialized hairs on ventral apex absent, ventral scopula absent, metatarsi I and II meso-apical comb absent, metatarsi III and IV weak ventral scopula absent, tibiae and metatarsi with scattered pores set in small depressions without raised margins. Leg spines absent. Tarsal proclaws



Figs. 115–118. *Epectris apicalis* Simon, cephalothorax, female. **115.** Dorsal view. **116.** Lateral view. **117.** Anterior view. **118.** Posterior view.

inner face striate, retroclaws inner face striate. Tarsi I, II superior claws with one tooth on lateral surface of proclaw, five teeth on median surface, one tooth on lateral surface of retroclaw, five teeth on median surface (fig. 139). Tarsi III, IV superior claws with one tooth on lateral surface of proclaw, four teeth on median surface, one tooth on lateral surface of retroclaw, four teeth on median surface (fig. 140). Trichobothria examined with SEM, tibia: each with three; metatarsus: each with one; base rounded, aperture internal texture not gratelike, hood smooth. Tarsal

organ with 2 sensilla visible. GENITALIA: Epigastric region with sperm pore visible, small, oval, situated at level of anterior spiracles (fig. 130), rebordered. Epigastric furrow without Ω -shaped insertions, without setae. Palp normal size, not strongly sclerotized, right and left palps symmetrical. Cymbium yellow brown, bulb yellow brown, proximal segments yellow brown, embolus dark. Embolus prolateral excavation absent. Trochanter normal size, unmodified. Femur normal size, two or more times as long as trochanter, without posteriorly rounded later-

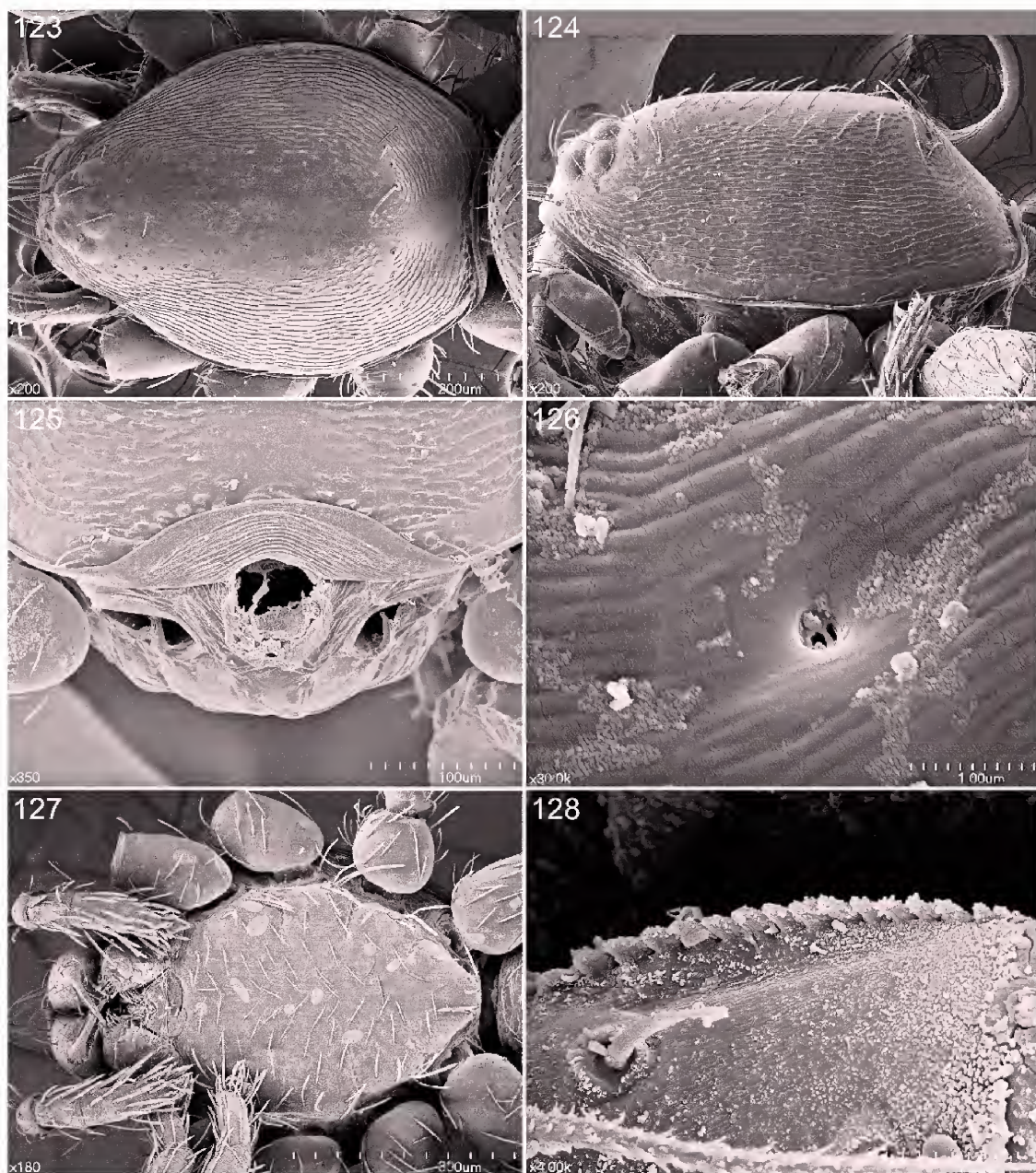


Figs. 119–122. *Epectris apicalis* Simon, male, cephalothorax, SEM. **119.** Carapace, dorsal view. **120.** Carapace, lateral view. **121.** Mouthparts, ventral view. **122.** Sternum, ventral view (note anterior depression).

al dilation, attaching to patella subbasally. Patella longer than femur, much larger than femur, without prolateral row of ridges, setae unmodified. Tibial trichobothria examined using SEM, one. Cymbium narrow in dorsal view, completely fused with bulb, no seam visible, not extending beyond distal tip of bulb, plumose setae absent, without stout setae, without distal patch of setae. Bulb 1 to 1.5 times as long as cymbium, slender, elongated, with sharp basal protrusion, middle part strongly narrowed, with beak-shaped terminal elements (figs. 145–148, 151–156).

FEMALE (PBI_OON 26956). Total length 1.39, habitus as in figs. 108–110. As in male except as noted. **CEPHALOTHORAX** (figs. 115–118, 123–128): Sternum surface anterior margin unmodified. Endites antero-medial tip unmodified. *Palp*: claw absent;

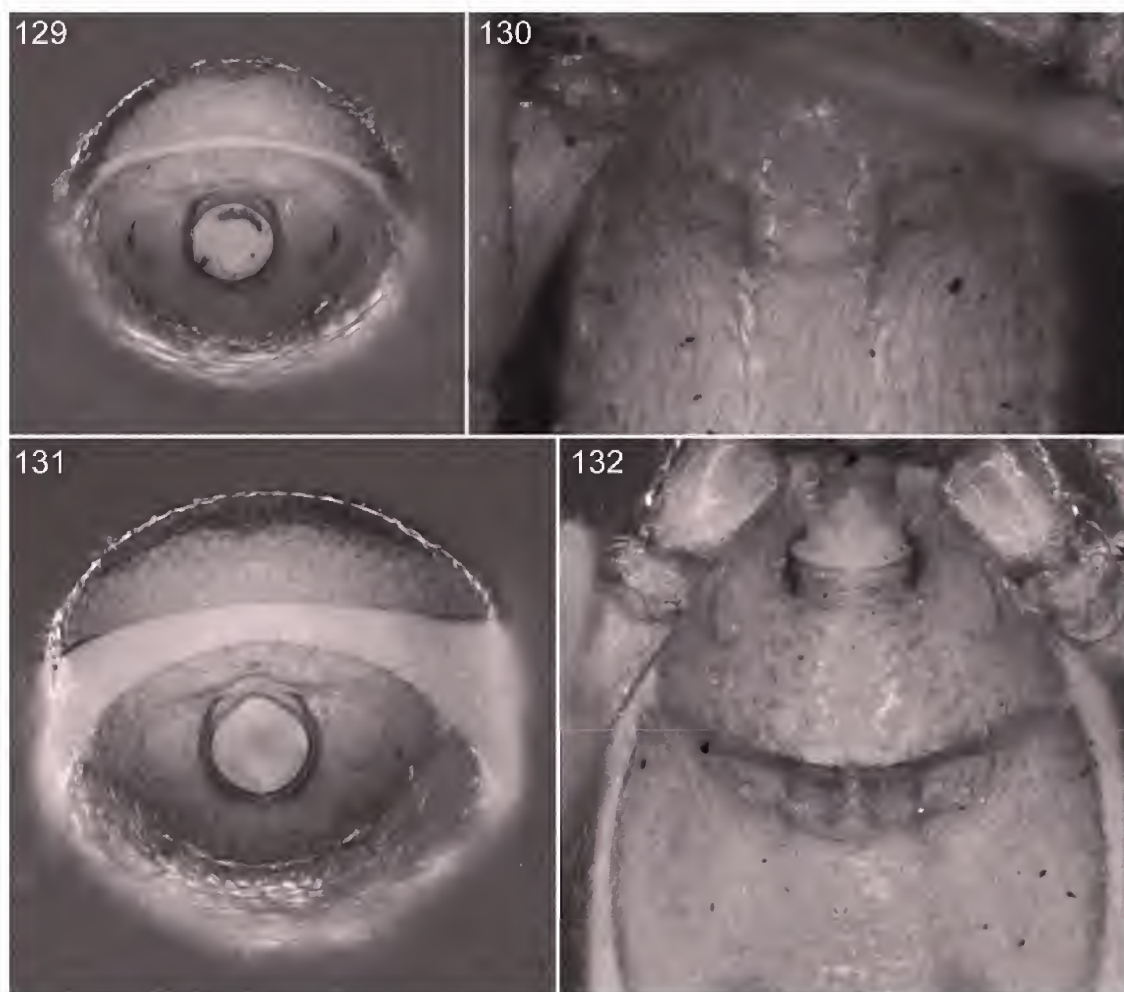
spines absent; tarsus unswollen, patella without prolateral row of ridges, tibia with three trichobothria (fig. 135); tarsal organ with elongate aperture (fig. 138). **ABDOMEN** (figs. 131, 157): Dorsal scutum covering more than 3/4 of abdomen, more than 1/2 to most of abdomen width. Postepigastric scutum covering about 3/4 of postepigastric area, not fused to epigastric scutum. Spinnerets not scanned. **LEGS** (figs. 133, 134, 136, 137): Tarsi I, II superior claws median surfaces with 15–20 small, distal teeth, lateral surfaces with five large, basal teeth (figs. 141, 142); tarsus III superior claws median surfaces with six small, distal teeth, lateral surfaces with five large, basal teeth (fig. 143); tarsus IV superior claws median surfaces with five small distal teeth, lateral surfaces with five large, basal teeth (fig. 144). **GENITALIA**: Ventral view: epigas-



Figs. 123–128. *Epectris apicalis* Simon, female, cephalothorax, SEM. **123.** Carapace, dorsal view. **124.** Carapace, lateral view. **125.** Carapace, posterior view. **126.** Carapace pore, lateral view. **127.** Sternum and mouthparts, ventral view. **128.** Serrula, ventral view.

tric region with inverted V-shaped sclerotization situated posterior of epigastric furrow (figs. 132, 149, 158, 160). Dorsal view: sclerotized portion of T-shaped receptaculum originating at epigastric furrow, anterior of external sclerotization (figs. 150, 159).

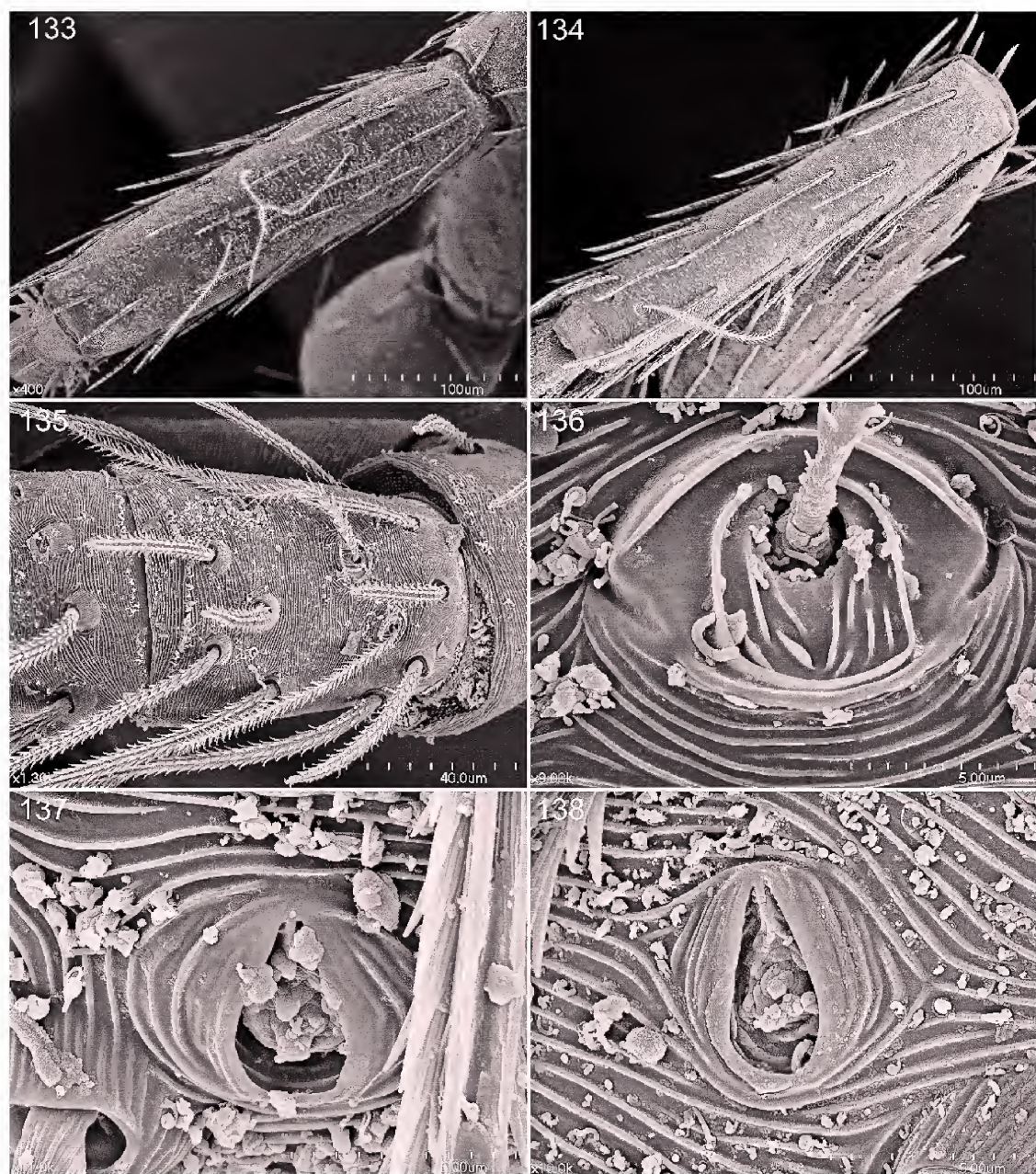
MATERIAL EXAMINED: UNITED STATES: **Florida:** *Monroe Co.:* Big Pine Key, Long Beach National Key Deer Refuge, Long Beach Drive, 24°38.716'N, 81°19.900'W, Apr. 15, 2008, hand sifted, litter, broad-leaf forest (P. Sierwald, FMNH 34929, 34931,



Figs. 129–132. *Epectris apicalis* Simon, abdomen. 129, 130. Male. 131, 132. Female. **129, 131.** Anterior view. **130, 132.** Epigastric area, ventral view.

PBI_OON 10600, 10602), 3 ♂, 4 ♀. MEXICO: **Nayarit:** Mantauchen Beach, San Blas, Sept. 9, 1966 (W. Ivie, AMNH PBI_OON 31181), 1 ♀; San Blas, May 14, 1963, 21°32'N, 105°18'W (W. Gertsch, W. Ivie, AMNH PBI_OON 1391), 4 ♂, 2 ♀; 7 mi E San Blas, July 27, 1964 (W. Gertsch, J. Wood, AMNH PBI_OON 1407), 4 ♂, 3 ♀. PANAMA: **Canal Zone:** Balboa, May 1964 (A. Chickering, MCZ PBI_OON 37517), 1 ♂, May 14, 1964 (A. Chickering, MCZ 72459, PBI_OON 26960), 22 ♂, 26 ♀, May 24, 1964 (A. Chickering, MCZ 72497, 72459, PBI_OON 26954, 26961), 33 ♂, 61 ♀, May 27, 1964 (A. Chickering, MCZ 72464, 72467, PBI_OON 26953, 26964), 15 ♂, 16 ♀, May 28, 1964 (A.

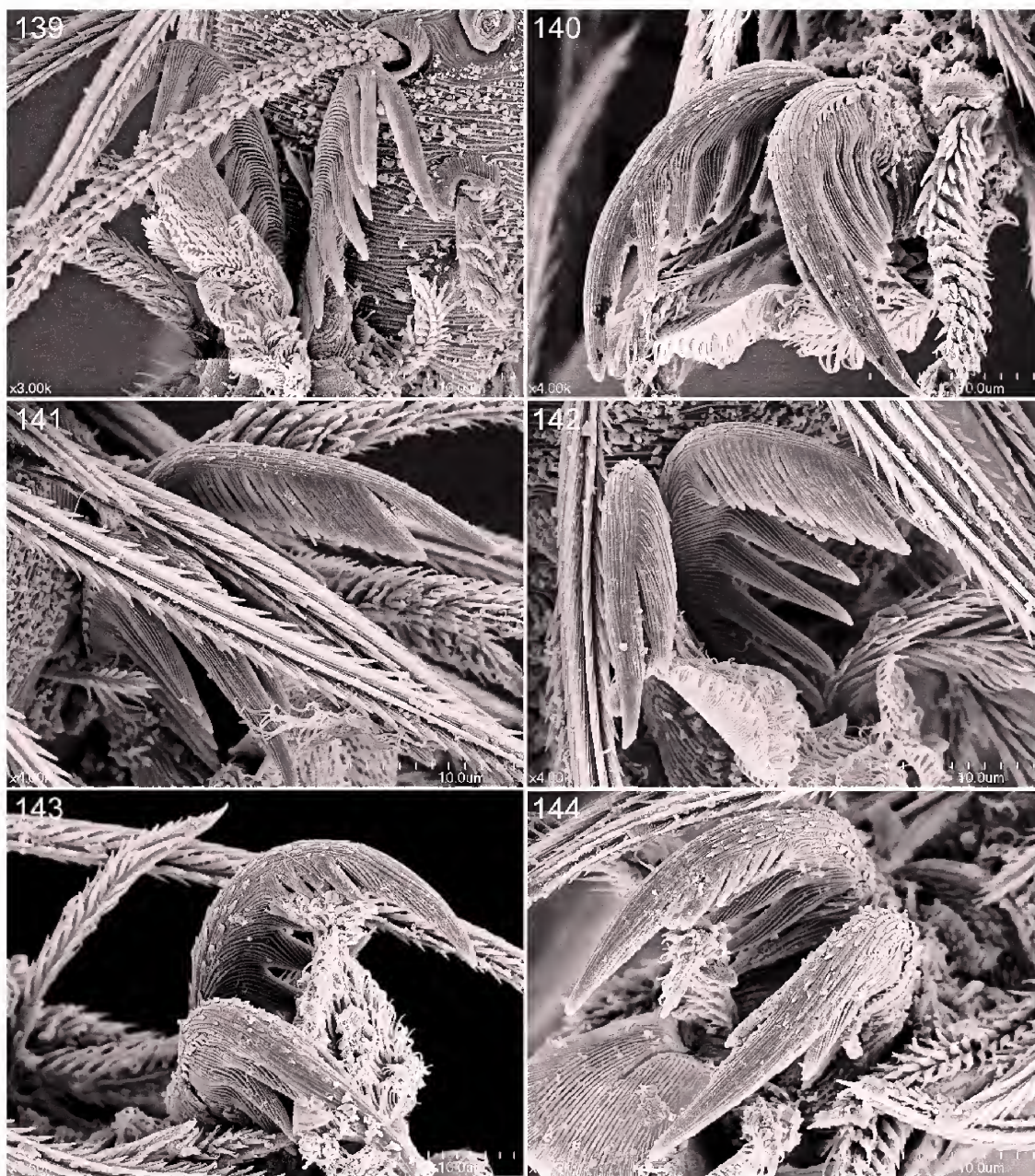
Chickering, MCZ 72540, 72462, 72497, PBI_OON 26951, 26952, 26962), 3 ♂, 2 ♀, May 28–29, 1964 (A. Chickering, MCZ 68297, PBI_OON 26965), 62 ♂, 82 ♀, May 30–31, 1964 (A. Chickering, MCZ 72452, 72470, PBI_OON 26955, 26956), 50 ♂, 51 ♀; Corozal, Jan. 4, 1958 (A. Chickering, MCZ 72465, PBI_OON 26959), 1 ♀, May 25–26, 1964 (A. Chickering, MCZ 72469, PBI_OON 26957, 26963), 24 ♂, 27 ♀; Gamboa, Jan. 28, 1958 (A. Chickering, MCZ 72457, PBI_OON 26958), 1 ♀. ECUADOR: **Guayas:** Guayaquil, Mar. 21, 1942 (H. Exline, D. Frizzell, CAS 9023416, PBI_OON 35247), 1 ♂; Milagro, May 10, 1942 (H. Exline, D. Frizzell, CAS 9023417, PBI_OON 26815), 1 ♂. GALAPAGOS



Figs. 133–138. *Epectris apicalis* Simon, female, SEM. **133.** Tibia IV, dorsal view, showing three trichobothria. **134.** Metatarsus IV, dorsal view, showing single distal trichobothrium. **135.** Palpal tibia, dorsal view, showing three trichobothria. **136.** Base of trichobothrium from metatarsus IV, dorsal view. **137.** Tarsal organ from leg III, dorsal view. **138.** Tarsal organ from palp, dorsal view.

ISLANDS: Isla San Cristóbal: 4 km E Puerto Baquerizo Moreno, Feb. 1989, transition deciduous forest, elev. 150 (S. Peck, KBIN), 3♂ (identified by M. Saaristo). **Isla Santa Cruz:** Puerto Ayora, garden of Hotel

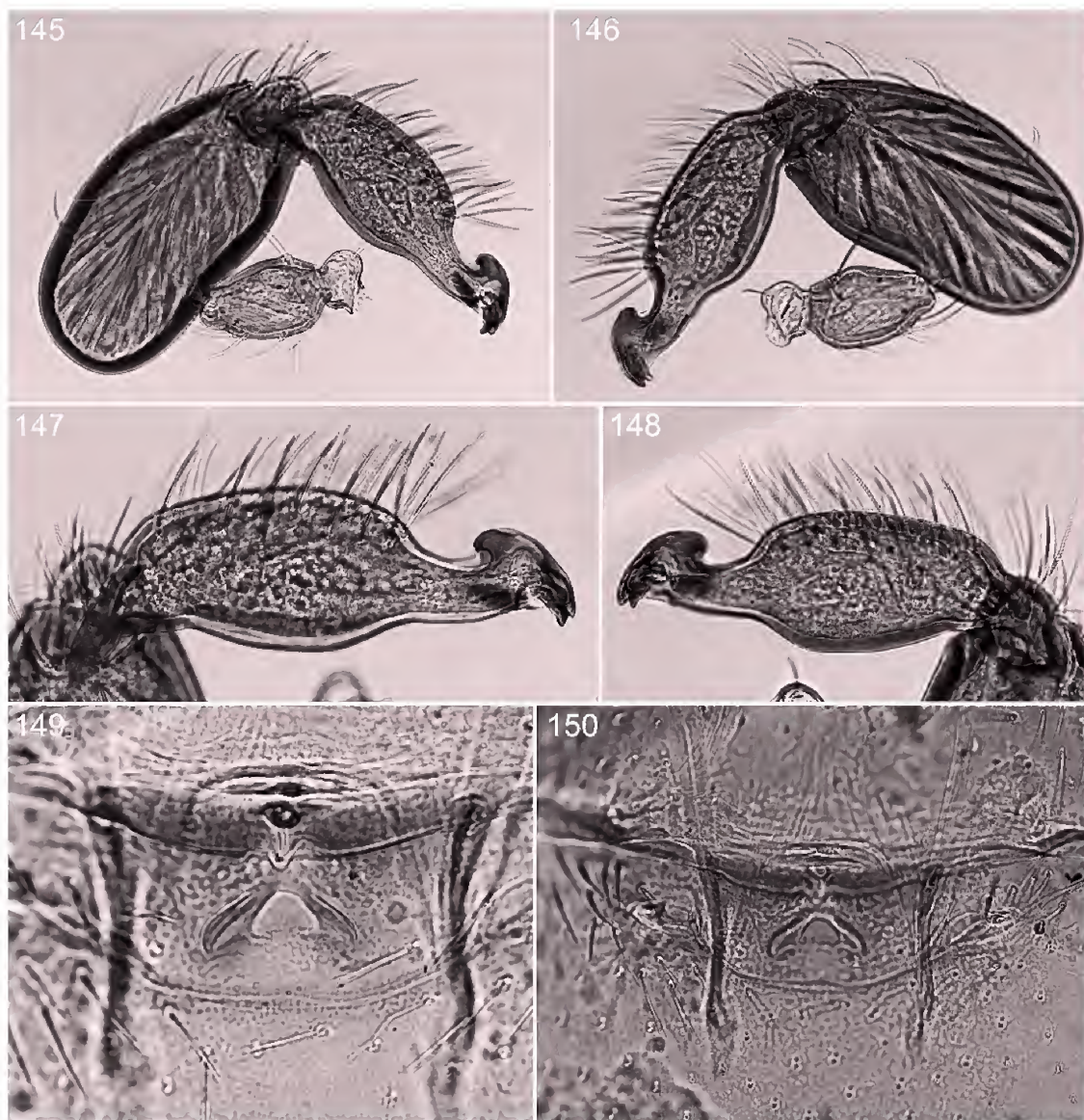
Fernandina, Aug.–Sept. 1992 (S. Abbedrabbo, KBIN PBI_OON 16762), 2♂, 1♀. **MASCARENE ISLANDS: Réunion:** near Savannah, Feb. 1, 1989, ground layer at ruins, moderately moist (H. Müller, MHNG



Figs. 139–144. *Epectris apicalis* Simon, tarsal claws, SEM. 139, 140, Male. 141–144. Female. 139, 141. Leg I, apical view. 140. Leg III, apical view. 142. Leg II, apical view. 143. Leg III, retrolateral view. 144. Leg IV, apical view.

PBI_OON 12172), 2♂, 4♀. SEYCHELLE ISLANDS: no specific locality, Jan. 23, 1977 (A. Rundle, AMNH PBI_OON 36431), 1♂. SINGAPORE: Kent Ridge Road, Mar. 24, 1986, shrubs, litter, elev. 70 m (J., F. Murphy, AMNH PBI_OON 36579), 1♂; Kusu Island,

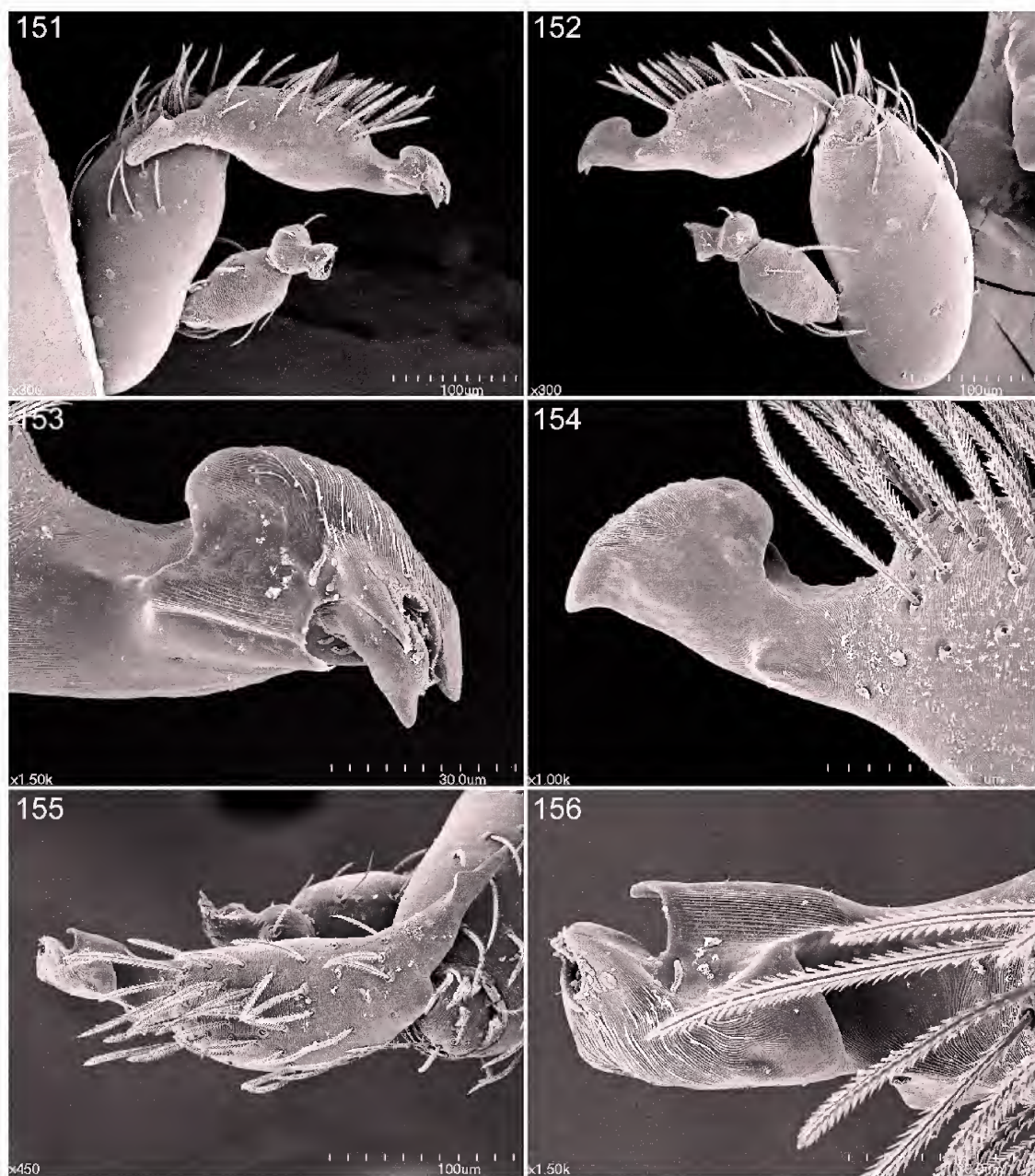
Mar. 24, 1986, scrub, stones, elev. 5 m (J., F. Murphy, AMNH PBI_OON 36578), 1♀; MacRitchie Reserve, Oct. 10, 1982, litter, elev. 40 m (J., F. Murphy, AMNH PBI_OON 36585), 1♂. PHILIPPINES: Luzon: “Manila!” (per label, Antipolo per description) (MNHN



Figs. 145–150. *Epectris apicalis* Simon, compound microscope. 145–148. Male palp. 149, 150. Female epigastric region. **145.** Prolateral view. **146.** Retrolateral view. **147.** Bulb, prolateral view. **148.** Bulb, retrolateral view. **149.** Ventral view. **150.** Dorsal view.

11842, PBI_OON 6255), 1♀ (holotype). BORNEO: **Brunei:** Brunei-Muara District: beach 4 km from Muara, 118 km from Kuala Belait, Nov. 27, 1988, elev. 0 m (C. Linehard, MHNG PBI_OON 15379), 1♀. **Sabah:** Manutik Isle, July 29, 1979, shore, scrub, elev. 0 m (J., F. Murphy, AMNH PBI_OON 36566), 1♀; Ulu Dusun, Aug. 6–7, 1979, garden, jungle edge, elev. 100 m (J., F. Murphy, AMNH

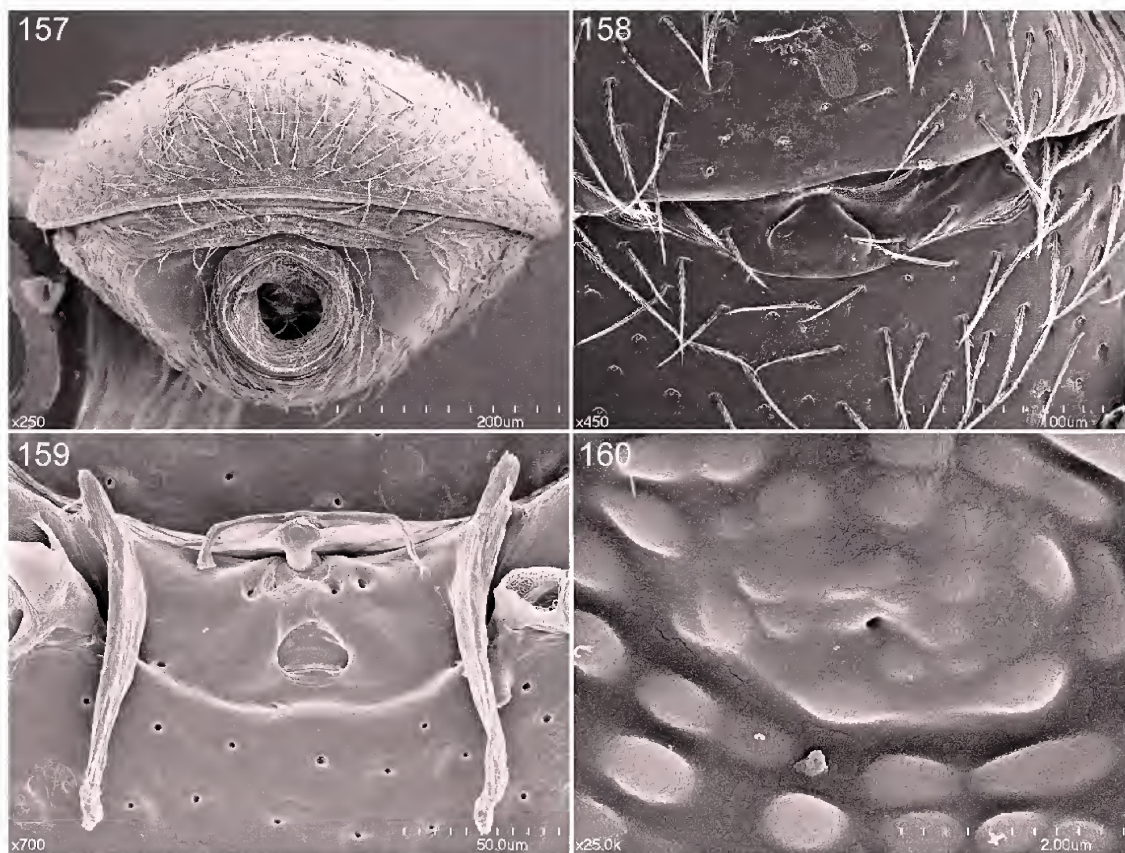
PBI_OON 36565), 3♀. HAWAII: **Hawaii:** Kau District, Route 11, mile marker 61, Feb. 6, 1997, ginger litter in cemetery (J., E. Berry, JAB PBI_OON 242), 1♂; Puna District, MacKenzie State Park, Feb. 3, 1997 (J., E. Berry, JAB PBI_OON 245), 1♂, 1♀. **Kauai:** Eleelie, Jan. 25, 1998, scrub in abandoned lot (J., E. Berry, JAB PBI_OON 244), 1♂, 2♀; National Tropical Botanical Garden, near



Figs. 151–156. *Epectris apicalis* Simon, left male palp, SEM. **151.** Prolateral view. **152.** Retrolateral view. **153.** Apical region of bulb, prolateral view. **154.** Same, retrolateral view. **155.** Bulb, dorsal view. **156.** Apical region of bulb, dorsal view (note likely fenestra).

Poipu, Jan. 20, 1998, elev. 20 ft (J., E. Berry, JAB PBI_OON 243), 1 ♂. **Oahu:** Kaneohe Bay, Jan. 15, 1983, mangrove litter (V. Roth, AMNH PBI_OON 203), 2 ♂. **PHOENIX ISLANDS:** Hull Atoll, Sept. 20, 1973 (R.

Clegern, J. Davidson, AMNH PBI_OON 211), 1 ♂. **COOK ISLANDS:** **Aitutaki:** Maina Island, June 3, 1987, coconut forest (J. Berry, JAB PBI_OON 246), 1 ♂. **Rarotonga:** Tuoro Hill, Mar. 10, 1987, in grass clump, elev. 200 m



Figs. 157–160. *Epectris apicalis* Simon, abdomen, female, SEM. **157.** Anterior view. **158.** Epigastric area, ventral view. **159.** Same, digested, showing T-shaped sclerotized portion of receptaculum and lateral apodemes, dorsal view. **160.** Pore near epigastric furrow, ventral view.

(J. Berry, JAB PBI_OON 247), 2♀. **MICRONESIA:** **Caroline Islands:** Palau: Angaup, Father John's Beach, Apr. 29, 1973, in beach rubble (J. Berry, J. Beatty, JAB PBI_OON 257), 3♀; Kayangel Atoll, May 22, 1973, coconut-*Barringtonia* litter (J. Berry, JAB PBI_OON 258), 2♀; Koror Island, Apr. 2, 1973, taro patch litter (J. Beatty, J. Berry, JAB PBI_OON 255), 1♂, Apr. 3, 1973, same (J. Berry, JAB PBI_OON 256), 1♀; Peleliu Island, Mar. 22, 1973, breadfruit litter on sandy soil (J., E. Berry, JAB PBI_OON 252), 7♂, 6♀; Pulo Anna Island, Apr. 7, 1973, coconut litter (J., E. Berry, JAB PBI_OON 254), 5♂, 4♀; Sonsorol, Apr. 6, 1973, forest litter (J., E. Berry, JAB PBI_OON 253), 5♀. Ulithi: Falalop, May 2, 1980, coconut forest litter (J. Berry, JAB PBI_OON 259), 1♀. Yap: no specific locality, June 1, 1973, among grass in cemetery (J. Berry, J. Beatty, JAM

PBI_OON 260), 3♂. Wanyan, Apr. 17, 1980, beaten from dead coconut fronds on ground (J. Berry, J. Beatty JAB PBI_OON 261), 1♀. **Marshall Islands:** Kwajalein Atoll, Roi-Namur Islet, July 9, 1968, *Scaerola-Messerschmidea-Pandanus* litter (J. Berry, JAB PBI_OON 249), 1♂, 3♀, July 22, 1969, litter in *Wedelia* thicket (J. Berry, JAB PBI_OON 248), 5♂, 2♀. Majuro Atoll: Ejit Islet, Aug. 5, 1969, *Ipomoea-Wedelia* community, among trash (J. Berry, JAB PBI_OON 251), 2♂, 2♀; Majuro Islet, Aug. 2, 1969, litter, breadfruit coconut community (J. Berry, JAB PBI_OON 250), 1♂, 1♀. **Ponape:** Ngatick Atoll, Ngatick Island, Jan. 17, 1970, leaf litter (M. Sabath, MCZ 72483, PBI_OON 28166), 1♂, 1♀. **NEW CALEDONIA:** ORSTOM Centre, Noumea, Dec. 12, 1986, Berlese, litter (J. Boudinot, MNHN PBI_OON 224), 1♂; Ouen Toro, Noumea, Sept. 3, 1990, dry forest,

elev. 125 m (N. Platnick, R. Raven, P. Goloboff, AMNH PBI_OON 216), 1 ♂.

DISTRIBUTION: Previously recorded from the Philippines, Banda Islands, Hawaii, Seychelle Islands, and Thailand, but also widespread in the New World (Florida, Mexico, Panama, Ecuador, and the Galapagos Islands), and here newly recorded from Réunion, Singapore, Borneo, Micronesia, and New Caledonia as well.

SYNONYMY: Suman's redescription of the species as *O. lena* is readily attributed to the absence of published illustrations for *E. apicalis*.

ACKNOWLEDGEMENTS

We are deeply indebted to Barbara Baehr for her collaboration throughout this project, and especially for suggesting that we investigate the relationships of *Epectris*. We thank the following colleagues for access to specimens: Giraldo Alayón, Luis F. de Armas, Léon Baert (KBIN), Joe Beatty (JAB), Janet Beccaloni (BMNH), Jonathan Coddington (USNM), James Cokendolpher and James Reddell (TMM), Charles Dondale (CNC), G.B. Edwards (FSCA), Gonzalo Giribet and Laura Leibesperger (MCZ), Charles Griswold and Darrell Ubick (CAS), Seppo Koponen and Yuri Marusik (MZT), Adriano Kury (MNRJ), John Murphy, David Ortiz, Diomedes Quintero (MIUP), Martín Ramírez and Cristian Grismado (MACN), Christine Rollard (MNH), Peter Schwendinger (MHNG, material kindly made available by Christian Kropf and Yvonne Kranz), Petra Sierwald (FMNH), and C. Viquez (INBIO). Helpful discussions with Barbara Baehr, Léon Baert, Matthias Burger, Cristian Grismado, Mark Harvey, Rudy Jocqué, Yuri Marusik, Ricardo Ott, Darrell Ubick, and the other members of the oonopid PBI team are much appreciated. This work was supported by the National Science Foundation (grant DEB-0613754).

SUPPLEMENT

We recently had the opportunity to examine the holotype of *Pelicismus vernalis* (Bryant), originally described as *Philesius vernalis* by

Bryant, 1945b: 178, without any illustrations. The female holotype, collected at Sebastian, Indian River Co., Florida (March, 1944, G. Nelson, MCZ PBI_OON 293) belongs to *O. concolor* and Bryant's name is here placed as yet another junior synonym of that species (NEW SYNONYMY). Bryant's redescription of the species is readily attributed to her generic misplacement, and her taxon was apparently completely overlooked by Chickering (1969) when he described the species yet again from Florida.

REFERENCES

- Álvarez-Padilla, F., and G. Hormiga. 2008. A protocol for digesting internal soft tissues and mounting spiders for scanning electron microscopy. *Journal of Arachnology* 35: 538–542.
- Baert, L., J.-P. Maelfait, F. Hendrickx, and K. Desender. 2008. Distribution and habitat preference of the spiders (Araneae) of Galápagos. *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique* 78: 39–111.
- Banks, N. 1896. New North American spiders and mites. *Transactions of the American Entomological Society* 23: 57–77.
- Benoit, P.L.G. 1977. Fam. Oonopidae et Tetrablemmidae. In: *La faune terrestre de l'Île de Sainte-Hélène IV. Musée Royal de l'Afrique Centrale Tervuren Belgique Annales Serie in Octavo Sciences Zoologiques* (8) 220: 31–44.
- Benoit, P.L.G. 1979. Contributions à l'étude de la faune terrestre des îles granitiques de l'archipel des Séchelles (Mission P.L.G. Benoit–J.J. Van Mol 1972). *Oonopidae* (Araneae). *Revue de Zoologie Africaine* 93: 185–222.
- Birabén, M. 1954. Nuevas Gamasomorphinae de la Argentina (Araneae, Oonopidae). *Notas del Museo de La Plata* 17: 181–212.
- Blackwall, J. 1859. Descriptions of newly discovered spiders captured by James Yate Johnson Esq., in the island of Madeira. *Annals and Magazine of Natural History* (3) 4: 255–267.
- Brignoli, P.M. 1974. On some Oonopidae from Japan and Formosa (Araneae). *Acta Arachnologica* 25: 73–85.
- Brignoli, P.M. 1975. Ragni del Libano. I. Note su *Opopaea punctata* (O. Pickard Cambridge, 1872) ed altre specie dello stesso genere (Araneae, Oonopidae). *Fragmenta Entomologica* 11: 223–233.
- Brignoli, P.M. 1978. Ergebnisse der Bhutan-Expedition 1972 des Naturhistorischen Museums in Basel. Araneae: Fam. Oonopidae, Agelenidae,

- Hahniidae und Mimetidae. *Entomologica Basiliensia* 3: 31–56.
- Brignoli, P.M. 1980. Two new Haplogynae from Thailand (Araneae). *Steenstrupia* 6: 5–8.
- Brignoli, P.M. 1983. A catalogue of the Araneae described between 1940 and 1981. Manchester, UK: Manchester University Press, 755 pp.
- Bryant, E.B. 1940. Cuban spiders in the Museum of Comparative Zoology. *Bulletin of the Museum of Comparative Zoology* 86: 247–554.
- Bryant, E.B. 1945a. Notes on some Florida spiders. *Transactions of the Connecticut Academy of Arts and Sciences* 36: 199–213.
- Bryant, E.B. 1945b. Some new or little known southern spiders. *Psyche* 52: 178–192.
- Burger, M., W. Nentwig, and C. Kropf. 2003. Complex genital structures indicate cryptic female choice in a haplogyne spider (Arachnida, Araneae, Oonopidae, Gamasomorphinae). *Journal of Morphology* 255: 80–93.
- Caporiacco, L.di. 1934. Aracnidi dell'Himalaia e del Karakoram, raccolti. *Memorie della Società Entomologica Italiana* 13: 113–160.
- Chickering, A.M. 1951. The Oonopidae of Panama. *Bulletin of the Museum of Comparative Zoology* 106: 207–245.
- Chickering, A.M. 1969. The family Oonopidae (Araneae) in Florida. *Psyche* 76: 144–162.
- Cooke, J.A.L. 1972. A new genus and species of oonopid spider from Colombia with a curious method of embolus protection. *Bulletin of the British Arachnological Society* 2: 90–92.
- Dumitresco, M., and M. Georgesco. 1983. Sur les Oonopidae (Araneae) de Cuba. *Résultats des Expéditions Biospéologiques Cubano-Roumaines à Cuba* 4: 65–114.
- Fannes, W., D. De Bakker, K. Loosveldt, and R. Jocqué. 2008. Estimating the diversity of arboreal oonopid spider assemblages (Araneae, Oonopidae) at Afrotropical sites. *Journal of Arachnology* 36: 322–330.
- Gertsch, W.J. 1936. Further diagnoses of new American spiders. *American Museum Novitates* 852: 1–27.
- Gertsch, W.J., and L.I. Davis. 1936. New spiders from Texas. *American Museum Novitates* 881: 1–21.
- Gertsch, W.J., and S. Mulaik. 1940. The spiders of Texas. I. *Bulletin of the American Museum of Natural History* 77(6): 307–340.
- Karsch, F. 1881. Diagnoses Arachnoidarum Japoniae. *Berliner Entomologische Zeitschrift* 25: 35–40.
- Keyserling, E. 1881. Neue Spinnen aus Amerika. III. Verhandlungen der Zoologisch-Botanisch Gesellschaft in Wien 31: 269–314.
- Kulczyński, W. 1899. Arachnoidea opera Rev. E. Schmitz collecta in insulis Maderianis et in insulis Selvages dictis. *Rozprawy i Sprawozdania z Posiedzen Wydziału Matematyczno-Przyrodniczego Akademji Umiejetnosci Cracov* 36: 319–461.
- Mello-Leitão, C.F.de. 1926. Algumas aranhas do Brasil meridional. *Boletim do Museu Nacional de Rio-de-Janeiro* 2: 1–18.
- Ott, R. 2003. Descrição de duas espécies novas de *Opopaea* do sul do Brasil (Oonopidae, Araneae). *Iheringia Série Zoologia* 93: 177–182.
- Platnick, N.I. 2009. The world spider catalog, version 9.5. New York: American Museum of Natural History (online at <http://research.amnh.org/entomology/spiders/catalog/index.html>).
- Saaristo, M.I. 2001. Dwarf hunting spiders or Oonopidae (Arachnida, Araneae) of the Seychelles. *Insect Systematics and Evolution* 32: 307–358.
- Saaristo, M.I. 2007. The oonopid spiders (Aranei: Oonopidae) of Israel. *Arthropoda Selecta* 15: 119–140.
- Saaristo, M.I., and Y.M. Marusik. 2008. A survey of African *Opopaea* Simon, 1891 (Arachnida, Araneae, Oonopidae). *Arthropoda Selecta* 17: 17–53.
- Saaristo, M.I., and A. van Harten. 2006. The oonopid spiders (Araneae: Oonopidae) of mainland Yemen. *Fauna of Arabia* 21: 127–157.
- Simon, E. 1891. On the spiders of the island of St. Vincent. Part 1. *Proceedings of the Zoological Society of London* 1891: 549–575.
- Simon, E. 1893a. *Histoire naturelle des araignées*. Paris: Roret, 1: 257–488.
- Simon, E. 1893b. Arachnides. *In: Voyage de M. E. Simon aux îles Philippines (mars et avril 1890)*. 6e mémoire. *Annales de la Société Entomologique de France* 62: 65–80.
- Simon, E. 1907. Étude sur les araignées de la sous-section des Haplogynes. *Annales de la Société Entomologique de Belgique* 51: 246–264.
- Suman, T.W. 1965. Spiders of the family Oonopidae in Hawaii. *Pacific Insects* 7: 225–242.
- Wunderlich, J. 1987. Die Spinnen der Kanarischen Inseln und Madeiras: Adaptive Radiation, Biogeographie, Revisionen und Neubeschreibungen. Langen, West Germany: Triops Verlag, 435 pp.
- Xu, Y.J. 1986. Two new species of oonopid spiders from China (Araneae: Oonopidae). *Acta Zootaxonomica Sinica* 11: 270–273.

Complete lists of all issues of the *Novitates* and the *Bulletin* are available at World Wide Web site <http://library.amnh.org/pubs>. Inquire about ordering printed copies via e-mail from scipubs@amnh.org or via standard mail from: American Museum of Natural History, Library—Scientific Publications, Central Park West at 79th St., New York, NY 10024. TEL: (212) 769-5545. FAX: (212) 769-5009.